



# International Abstract of Surgery

SUPPLEMENTARY TO

Surgery, Gynecology and Obstetrics

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*Supplementary to*  
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# INTERNATIONAL ABSTRACT OF SURGERY

JULY, 1932

## COLLECTIVE REVIEW

### CANCER OF THE BREAST

GRANTLEY WALDER TAYLOR, M D , F A C S , Boston

THE Library of the American College of Surgeons, as part of its service to the Committee on the Treatment of Malignant Diseases, has prepared at frequent intervals since 1924 comprehensive abstracts of the literature dealing with various types of malignancy. In addition there has been an accumulation of large numbers of reprints of literature of this sort. It seemed desirable to make this extensive material available to workers in these fields in the form of summaries dealing with specific types of malignancy. This paper is such a summary of the literature on cancer of the breast prepared for the Committee and covering roughly a period of ten years.

#### ETIOLOGY

*Incidence* The incidence of cancer of the breast is shown in Table I, derived from the Mortality Statistics of the Report of the Bureau of the Census for 1927.

It should be noted that the morbidity increases steadily with age, and that there is an increasing incidence of the disease with each decade.

Schreiner and Stenstrom, among 5,080 cases of malignant disease at the Hospital of the New York State Cancer Institute at Buffalo, found 563 cases of cancer of the breast, which constituted 11.08 per cent of the total number. Wood, in a statistical study in Pennsylvania, found that cancer of the breast accounted for 8 per cent of all cancer deaths. He stated that cancer of the breast is increasing at the rate of 3 per cent annually.

*Age incidence* Table II groups together several series of cases to show the age incidence of cancer of the breast. Although some authors em-

ploy decades such as from twenty-one to thirty years while others employ decades such as from twenty to twenty-nine years, and although in some series the age at the time of operation is given rather than the age at the time of onset of the condition, the table is accurate for all practical purposes. It is common experience that the maximum incidence of cancer of the breast lies between the ages of forty and fifty years. The average age incidence is between forty-seven and fifty-three years, and according to the majority of reports it is between forty-seven and fifty years.

Meier stated that the Swiss age incidence peak is from two to three years later than the age incidence peak in other German-speaking countries. Wainwright, in a comprehensive survey, found the American average age at the time of operation to be fifty-two and nine-tenths years, which is in contrast to the mean age of fifty-one and four-tenths years in Lane-Clayton's British series of cases.

Cases occurring before the age of twenty years are very rare and therefore are usually reported in the literature. Krauss and Kline quoted the Census Report as showing 85 deaths in the cases of women under twenty years in a twenty-five year period. Simpson found only 10 cases under the age of twenty-five years in 14,000 cases in a census report. Bloodgood stated that in 39 per cent of cases of malignant breast tumors the patients first noted a lump before the age of thirty. Wood stated that in the 1927 death returns for Pennsylvania the deaths from cancer of the breast under the thirty-fifth year of age constituted 4.4 per

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served that in 12 cases the average time elapsed between noted trauma and the onset of the disease was eight months. Howard Taylor, Jr. presented a table showing the elapsed time from trauma to the onset of the tumor in his series of 271 benign and malignant breast tumors.

#### *Relation of cancer to chronic cystic mastitis*

Much has been written in regard to chronic cystic mastitis and its relationship to cancer of the breast. Bloodgood has repeatedly presented careful histological studies of the various benign breast conditions with a discussion of their etiological relationship to cancer. His conclusion that cancer only rarely, if at all, develops in breasts presenting a single large cyst, but that it may be associated with the diffuse type of the disease is shared with reservations by most writers on the subject. McFarland made a beautiful histological study of normal breasts and arrived at the conclusion that "chronic cystic mastitis" is a type of post-lactational involution present in about 25 per cent of all post-lactation breasts. He called the condition "residual lactation acini." He is unable to establish any etiological relationship of this condition to cancer. He allowed for the possibility of the disease in women in whom no previous pregnancy had taken place in saying, "Local disturbances sometimes arouse the mammary tissue to develop large lobules like those of pregnancy, as in the surroundings of the benign encapsulated tissues studied with Bloodgood."

The rôle of stasis and faulty breast drainage has received considerable attention. Adair and Bagg concluded that stasis is very significant in giving rise to proliferative changes and subsequent cancer. They based their conclusions on some suggestive experimental observations on duct stasis in mice reported in detail by Bagg. Wainwright, in studies of sections of the whole breast by the technique of Cheate, demonstrated the relation of cancer to stasis. Davis quoted Ewing as stating that precancerous or cancerous changes are demonstrable in 50 per cent of breasts with chronic cystic mastitis. Howard Taylor, Jr. quoted MacCarty as stating that chronic mastitis was present in all of 1,000 cases of cancer of the breast.

Bloodgood's opinion in regard to the benignancy of the single "blue-domed" cyst has been mentioned. Adams stated that the incidence of cancer in these cases is about 2 per cent. Wainwright demonstrated that cancer can develop in relation to a single blue-domed cyst.

Howard Taylor, Jr. presented a most stimulating etiological analysis of benign and malignant breast conditions in which he advanced the thesis that these conditions develop in response to ab-

normalities in sexual endocrine factors. He then took up the various theories in regard to the nature and cause of chronic cystic mastitis and other breast conditions, giving a rather careful survey of the literature. Rodman also subscribed to the belief that the etiological factor is hormonal. Semb, in a careful statistical study, came to the same conclusion.

#### *Relation of cancer to pregnancy and lactation*

In defending the thesis of the hormonal origin of breast tumors, the writers cited, especially Taylor and Semb, made careful analyses of their series in respect to previous pregnancy and lactation. Taylor quoted Lane-Clayton to the effect that 18.3 per cent of 14,419 women with cancer of the breast were single as compared with 11 per cent of non-cancerous women. His own series showed also that among married women with cancer fertility was considerably lower than among controls. Semb's figures confirmed these findings although his series of cases was small. Of 135 cases reviewed by Semb, the cancer developed before the menopause in 59 and after the menopause in 76. The average age in these cases was fifty years. Thirty-eight and nine-tenths per cent of the women were nulliparæ, as compared with 28 per cent of "normal" women of the same age, 36.4 per cent were unmarried, as compared with 21 per cent of "normal" women of the same age, and 16.5 per cent had a sterile marriage, as compared with 8 per cent of "normal" women of the same age. The average number of children per mother was 3.85 whereas the average number for "normal" women of the same age is from 5 to 5.75. Of a series of 57 cases, abortion occurred in 7 (12.28 per cent). In 86 of 94 cases there was normal lactation, in 5, partial lactation, and in 3, no lactation. Of a series of 115 cases, a history of mastitis was given in 18 or 19 (15.6 per cent), and of a series of 139 cases, a history of trauma in 23 (16.5 per cent).

These figures receive some confirmation from the data presented by Wood. The 1927 Pennsylvania death rate from cancer of the breast among single women over thirty-five years of age was 109 per 100,000, while among married women over thirty-five years of age it was 44 per 100,000. Semb divided his cases of cancer on histological grounds into 2 groups, those with and those without evidence of "fibro-adenomatosis cystica" (presumably chronic cystic mastitis). The first group was characterized by a low average age (before the menopause), a high incidence of unmarried and sterile women, and low fecundity. As these factors were the same for chronic cystic mastitis as for cancer associated with it, Semb concluded that the cancer originated on the basis of the chronic

TABLE I.—DEATH RATE FROM CANCER OF THE BREAST PER 100,000 FEMALE POPULATION IN THE REGISTRATION STATES OF 1900

Age	1900	1905	1910	1917
5-9		3		
10-14		0.5	1	4
15-19		3.0	3	3.6
20-24	0.5	5.0	8.0	10.7
25-29	3.4	4.3	44.0	33.5
30-34	42.8	6.7	77.3	90.7
35-39	50.7	86.5	94.9	5.7
40-44	98.9	55.0	170.8	85.5
45-49				
All ages				
Crude rate	0	6.5	9.8	3.0
Adjusted	9.8	4.7	6.9	9.7

cent of all deaths from cancer of the breast, and those occurring before the forty-fifth year constituted 17.7 per cent of all deaths.

**Sex incidence.** There is involvement of the male breast in about 1 per cent of all cases. In summing up numerous series of cases in which specific mention of cases of cancer of the male breast was made, we found that of 8,354 cases, 70 occurred in males. Speed gave an excellent review of the subject of cancer of the male breast. Judd and Moore reported a series of 17 cases in males. Data are not available to warrant a definite statement as to the age incidence in males, but there is an impression that the average age is greater than in females. There is also an impression that the ratio of incidence of sarcoma to carcinoma is greater in males than in females.

**Race and nationality.** Wood, in his Pennsylvania study found 52 deaths from cancer of the breast per 100,000 white women over thirty-five years of age as contrasted with 26 deaths per 100,000 colored women over that age. Wainwright, analyzing his group of 603 cases, found that 81 per cent of the patients were born in the United States, against 64.2 per cent of his control group. He concluded that "we must not consider the large number of women of European birth or parentage a factor in increasing cancer morbidity." Simpson stated that cancer of the breast is second in frequency in English women, while it is next to the last in Japanese women. Meade reported a small series of cases from the Peking Union Medical College Hospital. He

TABLE II.—AGE INCIDENCE OF CANCER OF THE BREAST

Author	No. in series	5-9	10-14	15-19	20-24	25-29	30-34	35-39	40-44	45-49	50-54	55-59	60-64	65-69	70-74	75-79	80-84	85-89	90-94	95-99	Total
Abbott & Graves	75				10	47	30	5	3												95
Black	64		8	20	34	72															134
Macgregor	2,063		3	204	73	611	206	94	1												1,113
Lee & Tinsman	153		15	90	37	76	27														238
Philler & Williams	801		20	79	145	243	133	26													646
Schlesinger & Smetana	263		6	20	20	120	75	20	13												277
Marchevsky	21		13	20	67	26	20														146
Judd & MacCarty	61			127	108	127	66	27													455
Anderson & Park	100		7	33	9	67	24	7													147
Perry	64		9	66	127	100	130	24													456
Polansky	26		7	60	204	34	43	5													313
Total	6,061	5	124	623	1,004	1,909	1,008	268	71												7,713
Per cent			2.0	10.4	16.5	32.2	14.8	3.5	0.9												100

pointed out that the ratio between the cases of malignant disease of the breast and the total admissions ran considerably higher than at an American general hospital.

**Family history for cancer.** Practically all of the authors reporting give some place to heredity in the etiology of cancer of the breast. Lane-Clayton stated, "The percentages of cancer in parents are consistently somewhat higher than in the control series, but the differences are moderate in degree." Wainwright's own series led him to the same conclusion. He included in his own series the study of the incidence of cancer in the brothers and sisters, and found it definitely higher in his cancer series than in his controls.

Howard Taylor Jr. pointed out the desirability of specifying the kind of cancer present in the family history. He said, "It is impossible to believe that a history of squamous carcinoma of the tongue in the grandfather of a woman with cancer of the breast is of any importance. A history of carcinoma of the endometrium, of a fibroadenoma of the breast, or even of a myoma of the uterus is possibly of significance while a previous case of cancer of the breast in the family is probably worthy of serious consideration."

**Trauma.** Practically all authors include trauma as of some etiological significance in the disease. The incidence of antecedent trauma varies from about 5 to 25 per cent. Moschowitz et al. ob-

discharge in 5 of 218 cases of cancer. In the same period, 9 cases of bloody discharge were found to be due to duct papilloma. Smith and Bartlett had 4 cases of bloody discharge in 234 cases of cancer.

Judd characterized the discharge from an intracanalicular papilloma as odorless, sticky, and capable of causing a yellow stain on the dressing. The discharge from cancer is more watery, darker in color, and greater in amount, and often has a distinct rather foul odor.

It is fair to conclude that any discharge associated with tumor demands investigation, and that a bloody discharge demands investigation even if no tumor is palpable.

The incidence and significance of axillary lymph-node enlargement has received some discussion. Harrington found the nodes already involved by metastasis in 59 per cent of cases seen prior to 1915 and in 67 per cent of those seen since 1915. Of 967 cases reviewed by MacCarty and Mensing, a clinical diagnosis of axillary involvement was made in 325, but was confirmed microscopically in only 120 (36.9 per cent). Greenough found that of the series of 103 cases without axillary involvement which were collected for the American College of Surgeons, a pre-operative diagnosis of axillary involvement had been made in 20. Of 255 cases with axillary involvement, no clinical evidence of enlargement was apparent in 55. It is evident that, in many cases, freedom from clinical evidence of axillary node involvement is no guarantee that metastasis has not already taken place, and that, conversely, enlarged palpable nodes do not infallibly signify the presence of metastasis. It is worthy of note, in this connection, that in the group of cases with clinically imperceptible axillary metastasis a cure was obtained in 33 per cent, in contrast to 11 per cent in the group with clinically obvious metastasis.

#### DIAGNOSIS

*Diagnostic procedures.* Recently, attempts have been made to employ transillumination as an aid to diagnosis (Cutler) in addition to inspection and palpation, but reports correlating the findings of this procedure with those of pathological examination and other diagnostic methods are scant. Recently, also, Warren and others have employed roentgen examination of the soft parts of the breast. Bower and Clark have found skin prints of the breast of some aid. These procedures all require more extended use before an estimate of their value will be possible.

The diagnosis of the presence of metastases has made tremendous strides with X-ray examination of the skeleton and chest. Ginsburg, in a well-

illustrated case report, drew attention to a diffuse osteoplastic type of bone metastasis and quoted Kaufman to the effect that this type, rather than the usual discrete destructive lesions, constitutes about 14 per cent of all skeletal metastases.

The diagnosis of Paget's disease of the nipple was well discussed by Bloodgood. Lee and Tannenbaum gave an excellent resumé of the characteristics of the so-called inflammatory type of cancer of the breast first described by Volkmann in 1875.

*Differential diagnosis.* Wainwright warned against the assumption that multiple tumors are necessarily benign. Adair gave an excellent description of the distinctive features of gumma of the breast. Bloodgood described pathological and clinical features of encapsulated and non-encapsulated cystic adenomata. Lee and Adair described traumatic fat necrosis which often suggests cancer clinically. Tuberculosis of the breast is touched on in most reports of breast conditions, but is rarely mistaken for cancer. Tuberculosis of the axillary or cervical lymph nodes, however, has been interpreted as metastatic cancer of the breast. The coincidence of tuberculosis of the breast and cancer was reported by Smith and Mason who collected 18 cases from the literature.

The difficulty of distinguishing clinically between benign and malignant tumors of the breast is everywhere recognized. Sistrunk, quoting MacCarty, reported that 5.5 per cent of breast tumors clinically malignant proved to be benign, while 11.2 per cent clinically benign proved to be malignant. The coincidence of both conditions is of course to be expected, especially if benign tumors are believed to have an etiological relationship to cancer. Smith and Marks found that of 14 cases of papillary cystadenoma, cancer was present also in 4. Of 114 cases of chronic cystic mastitis, cancer was associated in 2 and developed later in 2. Cancer developed at a later date also in 1 case of fibroadenoma. Four and nine-tenths per cent of their series of patients had associated cancer at the time of operation for a benign tumor.

Sarcoma of the breast is reported usually along with cancer. The incidence of sarcoma in about 1,400 cases of cancer of the breast was 2.6 per cent. No great difficulty seems to be experienced in distinguishing sarcoma from cancer. D'Aunoy and Wright reported a series of 11 cases of sarcoma of the breast.

#### NATURAL HISTORY

*Anatomy and histology.* Excellent work has been done on the anatomy and histology of the breast. McFarland's monograph presented an excellent histological study of the breast at various



cystic mastitis. The second group was characterized by a higher age (after the menopause) and fecundity higher than normal. The cases of the first group outnumbered those of the second and thus gave the statistical complexion to the whole series.

It is impossible to give a brief résumé of Taylor's paper. The statistics of the series are less valuable than the plan of approach and the provocative character of the thesis.

Other series of case reports usually include data as to marriage etc. but controls are usually lacking and the material is accordingly less convincing. Of 200 women with cancer of the breast whose cases were reviewed by Adair and Bagg, 74 were childless. The remaining 126 had had 286 children and 172 miscarriages. The miscarriages were all accounted for by 62 of the patients. Only 8.5 per cent of the entire series had apparently normal nursing histories.

It is evident that the unused breast is especially liable to be the seat of cancer. Taylor argued that failure to nurse was usually due to lack of adequate secretion of milk, that is, to constitutional factors. The difficulty is that these data support as well the idea that defective drainage is the significant factor. It is not necessary to declare for one theory to the exclusion of the other: in fact there is some ground for supposing that the two conditions probably act together: faulty drainage precipitating cancer development in a tissue sensitized by endocrine disturbances.

*Relation of cancer to other diseases of the breast.* Taylor included adenofibrosis in his general discussion on etiology. Semb was inclined to attribute some rôle in cancer causation to nursing accidents such as mastitis and abscess. Wainwright discussed the rôle of lactation mastitis. Smith and Bartlett found 4 women in a series of 234 who previously had had breast abscess. There is a rather general opinion that fibro-adenomata may under go later malignant change usually sarcomatous. Bloodgood gave data on diverse other breast conditions and their relation to cancer. Intracanalicular papillary cystadenomata were studied by Judd, who found cancer present in 11 of 32 cases.

#### SYMPTOMS

There have been no new data on symptoms. The average pre-operative duration of symptoms gives some indication of the rate of growth of the disease and of the effectiveness of propaganda efforts. Similarly the ratio of incidence of benign to malignant breast conditions bears on the results of propaganda. Bloodgood found encouragement in data he presented on these points. Before 1900,

85 per cent of his breast tumors were cancers, whereas today the corresponding percentage is only 25. Primrose gave the following table:

Time of operation after onset	Prior to 1900 Per cent	1910-1921 Per cent
Within year	54.8	76.8
Within 6 months	35.4	53.6
Within 3 months	9	37.5
Within month	8.4	17

The average pre-operative duration in various series of cases ranged from nine to eighteen months. Many authors agreed with Bloodgood and Primrose that patients are reporting earlier, that the operability of cancer is increasing, and that the ratio of benign to malignant conditions shows some increase.

#### SIGNS

No new diagnostic signs have appeared within the last ten years. Bloodgood listed the significant signs in addition to a palpable tumor as dimpling, retraction of the nipple, and atrophy of the subcutaneous fat overlying the tumor. Of chief interest has been the attempt to evaluate the significance of discharge from the nipple. In this connection Bloodgood stated that a serous discharge from the nipple without a palpable tumor is not an indication for operation, and that a woman with such a discharge is in no more danger of developing cancer than any other woman of the same age. Of 876 cases of cancer of the breast, discharge from the nipple was the first symptom in but 16. Among 716 cases of benign tumors, a discharge was the first symptom in 24. MacCarty and Blending found a discharge from the nipple in 8.4 per cent of 962 cases of cancer and 6.6 per cent of 406 cases of chronic mastitis. Judd had 30 cases of cancer among 50 patients with a non-haemorrhagic discharge from the nipple. A tumor was palpable in 29 of these, and was the first sign noted in 23. Pain was present in 26.

In the series of 234 cases of Smith and Bartlett there were 5 cases with a non-haemorrhagic discharge. Gage found a discharge as the first evidence of disease in 5 of 101 cases of cancer.

A bloody discharge is rightly considered more serious. Grosswald found what he interpreted as precancerous changes in 80 per cent of 19 non-cancerous breasts in which there had been bleeding from the nipple, and concluded that all such breasts should be removed. Judd reported 50 cases of bleeding from the nipple of which 27 proved to be cases of cancer. In 5 of these, bleeding was the first sign. Graham thought that bleeding meant cancer in 80 per cent of all cases. Moschowitz reported the occurrence of a bloody

finger Patey proposed division of bony metastases into 2 groups, the one local (i.e., involving the sternum, ribs, clavicle), the other disseminated. The desirability of X-ray study of cases to determine operability is everywhere recognized. Practice at many clinics now includes pre-operative X-ray examination of the chest, spine, and pelvis. Other clinics add plates of the humeri, femora, and cranium. Which plates and how many will show practically all of the bony metastases present are questions still to be answered. Complete skeletal X-ray examination of every patient is hardly feasible and probably unnecessary.

There is some evidence, and a widespread clinical impression, that manipulation of a breast cancer can cause metastatic dissemination. This view is strongly supported by the fact that primary radical operation results in a higher percentage of cures than can be secured by radical operation performed some time after simple local excision of the cancer. Operative techniques have been elaborated to guard against undue manipulation. Recurrences in the operative area are rightly considered free cancer implants due to faulty operative technique. Knox extended Tyzzer's experimental demonstration of the relationship of massage to metastasis. Speed cited Speese as demonstrating direct extension or metastasis into the pectoral muscles. It is suggested that muscular activity is responsible for some of the subsequent dissemination of the disease.

**Survival.** A most important contribution on survival in cases of cancer of the breast was Daland's article reporting a series of 100 untreated cases (Chart II). Daland's curve of survivals at various intervals after the onset of the disease provides an essential measure for determining the value of any mode of treatment. It is obvious from such study that the course of the disease varies widely. Other authors have demonstrated the same fact less graphically. Buchanan had 1 case in which death occurred within three months after the onset, 8 cases in which it occurred within nine months, and 4 cases in which the patient survived for fifteen years. Bernstein reported the case of a patient aged seventy-eight years in whom the disease had begun twenty-five years previously. At the time of examination the local process was extensive, but there was no evidence of remote disease. Lee and Tannenbaum reported a series of 28 cases of the inflammatory type of cancer in which the course is uniformly rapid to a fatal termination. In a study of 363 inoperable cases of cancer they found that the average duration from the first symptom to death was four years and five months. One patient lived only five months, and

1 lived thirty-eight years and five months. Lazarus-Barlow and Leeming said, "The normal duration of unoperated cases averages three years from onset to death." Gottesman concluded, "The average duration of life of patients suffering from all types of unoperated cancer of the breast varies from three and two-tenths years to four years after the discovery of the tumor."

The duration of the tumor in an operable stage can be estimated from the duration of symptoms at the time of operation. Thus Crile analyzed the pre-operative duration of disease in 777 operable cases as follows:

Pre-operative duration	Cases
Less than 1 month	124
1-6 months	377
6 months-1 year	95
1-2 years	92
2-4 years	81
Over 5 years	10

Lee, in a series of 133 cases which were inoperable at the time of examination, found that in 30 per cent the average duration of symptoms was four months, while in 52 per cent it was ten months. *These figures suggest that in a large proportion of any operative series of cases the disease is of a slowly growing type, and that in an inoperable series of cases the reverse is true.*

Wyand, in a series of postoperative cases followed ten years, found the average duration after operation to be four and six-tenths years, but this series included some patients who were still alive. He concluded that probably five years is a better figure for the average postoperative duration. Moschcowitz et al. pointed out the decline in the percentage of cure the longer a postoperative group is followed, a five-year cure being obtained in 34 per cent, a six-year cure in 31 per cent, a seven-year cure in 26 per cent, an eight-year cure in 16 per cent, a nine-year cure in 7 per cent, and a ten-year cure in only 4 per cent. It is discouraging to realize that this percentage does not establish a definite stable level.

Lee and Tannenbaum found that the average duration of life after recurrence was two years and one month, the shortest one month, and the longest ten years and four months.

#### OPERATIVE TREATMENT

**Technique.** The modern conception of the radical operation for cancer of the breast derives from Halsted and Willy Meyer. The evolution of the operation was well described by Rodman and the technique by Harrington. Unfortunately the necessity for this radical operation is not universally appreciated, and various less radical

stages of development and function. A recapitulation of histological knowledge with special reference to the effect of the ovary was presented by Taylor who again drew attention to the work of Rosenberg in establishing the presence of a rhythmic change in the breast structure with the phases of menstruation. Taylor also stressed the changes accompanying pregnancy, lactation, involution, etc. Fraser studied especially the elastica at various stages of breast activity and discussed the hypothetical protective function it assumes by including the acini in normal senile breasts.

The lymphatics and drainage areas of the breast have been extensively studied. Elisendath presented a good study of the lymphatic chains. Handley emphasized especially the nodes situated along the course of the internal mammary vessels.

**Growth and spread.** The rarity of multiple foci of cancer suggests a single, probably minute origin at some one point in the breast. Growth proceeds at a variable rate which depends, in part at least, on the reaction of the surrounding tissues. Strunk and MacCarty and later Fitchow discussed as defensive factors originating in the surrounding normal tissues, cellular differentiation, fibrosis, hyalinization, and lymphocytic infiltration. The evidence for considering cellular differentiation a response of the host to the presence of the growth is certainly inconclusive. There is no question that the other factors are a response of the host and may have an influence on the rate of growth of the disease.

The rate of growth is doubtless influenced also by other factors. The age of the patient and the presence or absence of pregnancy or lactation probably exert an effect through hormonal influences. Intercurrent diseases such as diabetes may act by impairing the patient's capacity to develop defensive factors. It is possible but unproved, that other types of intercurrent disease may stimulate defensive factors.

The degree of cellular differentiation is in general in inverse ratio to the rate of growth. Its significance and interpretation will be discussed later.

The study of the mode of spread within the breast has received stimulation from the work of Cheate, Wainwright, Handley and others who by extensive histological studies, showed that spread occurs along connective tissue septa in the breast and along the deep fascia overlying the muscles. Handley's studies of lymphatics and lymphatic permeation are very significant. That spread may occur along the ducts and blood vessels seems to have been established by numerous writers.

The mechanism of metastasis has received much discussion. Handley apparently felt that lymphatic permeation is the only mechanism involved, and that it will satisfactorily explain all metastases. Schmidt, quoted by Simpson, found minute cancerous emboli in the terminal pulmonary arterioles in all of 15 cases of abdominal carcinoma coming to autopsy. He concluded that emboli are common, but practically always become encapsulated and degenerate. On account of the occurrence of widespread metastases without lymph node involvement, Thompson and Keller concluded that dissemination occurs by the blood stream.

Fraser made interesting studies of the whole breast by his key-block method. He showed that spread from the primary growth is direct by the lymphatics to the underlying fascia and then centrifugal. He noted some centrifugal spread in the breast itself especially after the lymphatics in the fascia became plugged. He observed no involvement of the skin lymphatics, and found no confirmation of Handley's idea that permeation takes place with clearing up of the disease centrally. He showed a concomitant duct and acinar hyperplasia spreading centrifugally from the growth with gradual assumption of malignant character later. He demonstrated spread of the disease by way of the ducts and vessels as well as by the lymphatics.

The frequency of metastases of various kinds has received some attention. The figures vary widely, depending on whether they derive from clinical or autopsy reports. Ewing quoted Gross's findings of pleural involvement in 50.9 per cent and pulmonary involvement in 49.9 per cent of 433 autopsies. Handley estimated the frequency of pleural metastases at 38 per cent. The incidence of metastases in bone as reported by several authors on the basis of autopsy findings is shown by Giles as follows:

Author	Autopsies	Bone metastases Per cent
Wilkins	803	36.5
Handley	330	
Gross	433	49.9
Karofsky	93	55.3
Ginsberg	67	74.0

Capricious or unusual metastases are reported frequently in the literature. Bendick presented a case of widespread bone metastasis involving even phalanges and metacarpals. Mal reported an unusual case with bony metastases involving the malar bone, maxilla, and tarsus. Ingram reported a case with metastases to the nailbed of a finger which simulated an acute septic condition of the

**Operability** Gottesman stated that when a radical operation is carried out in the presence of contra-indications it shortens the life of the patient. As contra-indications he considered a tumor fixed to the chest wall, fixed axillary lymph nodes, and oedema of the arm. He said, "Such patients live longer without an operation, and simple mastectomy gives a longer lease of life than radical operation. In addition, operation shortens life in inflammatory cancer and in cancer developing during pregnancy."

Unfortunately other writers have too often failed to be explicit as to the criteria of operability. These vary with the estimate of the rôle of radiation. In some clinics the presence of remote metastases is not considered a contra-indication to operation, and in many clinics search for remote foci by X-ray examination is neglected or incomplete. Failure to state criteria of operability makes it difficult and unfair to compare the results of operative series in different clinics. Many of the differences in end-results reported are due to variations in this factor.

#### PROGNOSIS

**Age** Perry gave a table showing the results of operations at various ages with the percentage of patients in a given age group who were living after more than three and more than seven years.

Age	Living more than 3 years Per cent	Living more than 7 years Per cent
Over 70		44
65-69	12	40
60-64	22	44
55-59	11	28
50-54	20	40
45-49	15	32
40-44	13	37
35-39	7	24
30-34	16	31

Sistrunk and MacCarty found that 41.7 per cent of women over fifty years of age were living from five to eight years after operation, as compared with 31.8 per cent of women under fifty years of age. Wyard concluded after a careful statistical study that "the age of the patient does not influence one way or the other the prognosis as regards ultimate survival after operation."

**Duration of disease before operation** Buchanan pointed out that in 70 cases in which operation was done from one to thirteen years after the onset of cancer the incidence of cure was 11 per cent higher than in 153 cases operated on within the first year of the disease. Davis found that in a group free from recurrence three years after operation the average pre-operative dura-

tion was identical with that of the group presenting recurrence, and that in patients without axillary involvement the pre-operative duration was greater than that in a selected group of patients with axillary involvement, most of whom died promptly. When operable cases with axillary involvement had a long pre-operative duration, the prognosis was better than in cases in which the pre-operative duration was shorter.

All of these paradoxical findings are of course due to the rapid rate of growth of the more virulent types of the disease and the consequent inclusion of a greater proportion of these in the groups with a short pre-operative duration. Stanton emphasized that the term "early operation" should be used to mean early in relation to the extent of the disease rather than in relation to the pre-operative duration of the disease. In a case of malignancy the more promptly operation is performed the better the prognosis.

**Location of the growth in the breast** Bunts offered percentages of five-year cures depending on the location of the growth in the breast, as follows:

Site	Percentage of cures
Upper outer quadrant	21.3
Upper inner quadrant	38.1
Lower outer quadrant	34.0
Lower inner quadrant	25.0
Central	39.3

Abell and Graves believed that the prognosis is more favorable in cases of outer quadrant growths than in cases of inner quadrant growths. Sistrunk concluded that the results are best in cases of growths in the upper inner quadrant. In cases of growths situated close to the nipple which had already formed axillary metastases Sistrunk and MacCarty found the prognosis very poor.

It is very evident even from these few citations that many contradictory points of view obtain. The fact that growths in the outer quadrants metastasize first to the axillary nodes is established by clinical experience and anatomical studies of the lymphatics. Furthermore, these growths remain movable in relation to the chest wall longer than inner quadrant growths. Inner quadrant growths may form their first metastases in the supraclavicular region, in the thorax, or even in the liver. Thus it is fair to assume that any surgically treated series of cases contains a relatively high proportion of late operable cases of growths in the outer quadrants, and that correspondingly advanced states of disease in the inner quadrants might be considered already inoperable. Confirmation of such an assumption is virtually impossible. Blackburn quoted Sistrunk

procedures are still widely practiced, always with poorer results and fewer cures. In the less radical procedures the attempt is usually made to preserve the pectoralis minor muscle, and in many of them too much skin is preserved over the breast. Wainwright demonstrated the presence of invasion of the pectoralis minor muscle and the necessity for its removal. Greenough showed statistically the decrease in cures which results when the pectoralis minor is preserved. White, reporting results obtained at the Roosevelt Hospital in New York, where the pectoralis minor is preserved as well as considerable skin, stated that local recurrences were found in 36 per cent of all recurrent cases. Bloodgood said, "Recurrence in or in the region of the scar is due to late intervention or bad surgery." Scott suggested that the incidence of local recurrence within three years be used as a criterion of operative technique.

Many writers have emphasized the necessity for wide skin removal, including especially the skin pathway from the breast toward the axilla. Numerous modifications of the standard operation have resulted from the desire to bring about wide skin removal and at the same time to accomplish primary closure. Jennings, Smith Jackson, Babcock, Coughlin, Cairer and others reported modifications of the standard operations and various types of plastic closure. Some of these operations preserve for use in plastic closure parts of skin under suspicion. Jackson described local recurrence twice in an infraclavicular flap swung down for closure. The operations differ widely also in the amount of rectus fascia removed. Several go practically all the way to the umbilicus. Some European writers have advocated removal of the serratus digitations, which in the United States is commonly held unnecessary.

Cole described the novocain anesthesia technique for the radical operation. Guthrie gave a description of the anatomical aspects of the Rodman incision.

Advocates of a supraclavicular extension of the operation are very rare at present. Winslow raised the question of the desirability of operations for sternal or rib recurrences or extensions and concluded that such procedures are possible but rarely justifiable. Wiener reported several resections of parts of the chest wall for recurrences. Most of the patients died so promptly as to make the operations seem completely unjustifiable. Lanphear resected the manubrium for recurrence. The left innominate vein was cut and sutured successfully with operative recovery.

Anderson reported on the use of surgical diathermy in 56 breast operations. Scott described

his electric cautery operation. Mason reported 3 operations done by the Scott technique. At the time of his report Scott had done 65 radical breast operations, all of which were followed by freedom from local recurrence and 8 of 11 of which were followed by five year cure. Percy described a very radical operation with the "hot knife" technique. Handley described a technique for combining radium implantation with radical operation. None of these innovations has been widely adopted, and further figures are desirable before an attempt is made to estimate their value.

Ducuing analyzing the histories of 103 cases followed up found postoperative pulmonary complications in 5, hematomata in 5, phlebitis in 3, and stiffness of the arm or shoulder in 1. Davis reported a case of accidental puncture of the axillary artery during operation. The vessel was sutured, but gangrene developed. Disability in the use of the arm after operation continues to occur occasionally but is minimized by most writers.

Dynes recommended the Kondoleon operation for relief of the swollen arm.

**Mortality.** Figures for the operative mortality vary from less than 1 to nearly 5 per cent. In the total number of 3,308 operations reported there were 67 deaths, a mortality of about 2.3 per cent. In general, the operative mortality is higher in small than in large series of cases. The causes of 40 of the 67 deaths cited were recorded as follows:

Cause	Deaths
Heart, kidney and cerebral conditions	8
Diabetes	3
Anaesthesia	
Shock	3
Sepsis	0
Pneumonia	4
Pulmonary embolism	5
"Pulmonary"	8
Heat stroke	1

Analysis of these causes suggests that many of the deaths were possibly avoidable.

Postoperative deaths from a cardiac or renal cause suggest lack of care in the preliminary study and preparation of the patient. The same is true of postoperative deaths from diabetic coma and may be true of at least some of the deaths from pulmonary complications, anaesthesia, and shock. Deaths due to sepsis and the rest of those due to anaesthesia and shock are accounted for by defects in surgical technique. The great variability in the incidence of pulmonary complications in different clinics suggests that routines of operative technique and postoperative care are significant factors in the development of these complications.

None of the writers mentioned was very favorably impressed by the prognostic significance of the so-called defensive factors described by Sistrunk and MacCarty.

By special staining methods, Delbet and Mendaro demonstrated 2 types of secretory activity, albuminous and mucous. They felt that the presence of such demonstrable secretion is of very favorable prognostic significance. Their figures are not very clear as to how many patients of their series could be followed up. They described as an unfavorable factor a direct invasion of blood vessels by tumor cells, a so-called "hæmophile" tendency.

*The defensive factors of Sistrunk and MacCarty.* Sistrunk and MacCarty analyzed 91 fatal cases of cancer of the breast for the presence or absence of their so-called defensive factors of differentiation, fibrosis, lymphocytic infiltration, and hyalinization. As their mode of presentation of the material was rather confusing, it is difficult to draw conclusions. According to one of their tables, the average postoperative life of patients with local lymphocytic infiltration was about twenty months, while that of patients without local lymphocytic infiltration was twenty-three months. Similarly, when lymphocytic infiltration was combined with fibrosis, the presence or absence of this combination apparently did not affect the duration of postoperative life. Cellular differentiation very definitely added a year to the postoperative duration, which might be anticipated on the ground that it is an attribute of the degree of rapidity of growth. As suggested elsewhere, the evidence for considering cellular differentiation as a reaction of the host is not conclusive.

The difficulty is that the figures presented by Sistrunk and MacCarty are based on fatal cases and therefore the significance of their findings for prognosis including apparent cures is at once vitiated. The series of cases is probably too small to permit subdivision into so many subclasses, and conclusions seem hardly justifiable in spite of the rather impressive percentage figures given. Thus with regard to the statement, "The average length of postoperative life of patients with fibrosis was 42 per cent greater than that of patients without fibrosis," it should be noted that the difference was a little less than two months.

Flothow studied the same factors in relation to a larger group of cases including some that were cured. He chose 2 groups of patients, those who had had axillary involvement and survived more than five years after operation, and those without axillary involvement who died within five years after operation. He found 70 per cent of the de-

fensive factors present in the first group, in contrast to 26 per cent in the second group. This is a fairly satisfactory correlation with prognosis.

Dupont and Leroux analyzed 15 cases in regard to evidence of stroma activity and concluded that such activity is of definite favorable prognostic significance. They believed that X-ray treatment may break down the defense of this active stroma. In radiated cases the stroma found was "poorer" in defense qualities and recurrence developed earlier. Needless to say, data from such a small series are not of great significance.

*Pregnancy and lactation.* There is general agreement that associated pregnancy or lactation renders the prognosis very grave. Sistrunk and MacCarty stated, "Carcinoma which developed during pregnancy and during the lactation period invariably proved fatal within five years after operation." Harrington concluded that operation is not justifiable in cases of pregnancy as in such cases the prognosis is hopeless. Of his 28 cases of carcinoma complicated by lactation, death occurred within one year after operation in 9 and within two years in 5, and 1 patient survived, apparently cured, for six years. Abell and Graves reported the case of a woman who developed a carcinoma of the breast in the fifth month of pregnancy and was living and well seven years after operation.

*Other diseases.* Data on the effects of other complicating diseases are few. Harrington pointed out the gravity of the prognosis when diabetes is present. Of 12 cases of carcinoma of the breast in diabetics, axillary involvement was present at the time of operation in 8. In the latter, the average postoperative survival was fourteen months. One patient lived three years. In the 4 cases without axillary involvement, the average postoperative survival was two and one-half years. One patient lived three and one-half years.

*Clinical index of malignancy.* Lee and Stuebord elaborated a scheme for a clinical estimate of the degree of malignancy based on the age of the patient, rate of growth and extent of the lesion, and the presence or absence of lactation. Each of these factors is weighted and in addition has gradation factors. The index is secured by multiplying the weights of the factors by their gradation factors and adding the results. The figure thus obtained is somewhere between 11 and 55, the latter representing coincidences of all the most malignant characteristics. Cases were divided into 3 groups with indices running from 11 to 25 for relatively benign cases, from 26 to 39 for moderately malignant cases, and from 40 to 55 for highly malignant cases. On this basis it was

to the effect that the axillary nodes were involved in 64 per cent of cases of outer quadrant growths, 50 per cent of cases of lower inner quadrant growths, and 31.6 per cent of upper inner quadrant growths. It would be desirable to know the average pre-operative duration of outer quadrant growths as compared with that of inner quadrant growths, even though such figures would be open to the criticisms mentioned in the discussion of pre-operative duration.

**Presence of metastases.** There is general agreement that the prognosis for cure is essentially nil if metastases are present elsewhere than in the axilla. In regard to axillary metastases, extensive figures contrasting the prognosis with and without axillary metastases are available. These will be discussed more fully in the consideration of the end-results. A few figures are presented here merely by way of illustration.

Author	Nodes not involved, living and well		Nodes involved, living and well	
	5 years Per cent	10 years Per cent	5 years Per cent	10 years Per cent
Greenough	50		24	
Harrington	63.6	44.1	84.3	3.4
Electron and MacCarty	65		9	
White	70	57	9	
Smith and Bartlett	66.7		85.9	
Bonte	35	8	30	8.8

Moscowitz reported that in his cases in which death occurred within three years after operation the incidence of axillary involvement at the time of operation was 81 per cent whereas in those in which the patient lived longer than five years it was only 50 per cent. Peck and White found that of 59 patients dead of recurrence 48 had had axillary involvement, while of 53 living and well, only 17 had had axillary involvement.

**Pathological types.** Relatively little has been written in recent years with regard to the prognosis in relation to the classical pathological types. When figures have been given, the types have often been so subdivided that too few cases have been included in a group. Terminology is so confused as to prevent accurate comparisons between various series.

In the rare colloid cases the outlook is apparently relatively favorable. Cheate and Cutler, describing gelatinous cancer of the breast, stated that it does not carry any implications of benignancy.

Author	Percentage of patients living and well after three years			
	Scirrhus carcinoma	Adeno-carcinoma	Mucillary carcinoma	Carcinoma simplex
Lane-Clayton	35	47.5	32.4	
Antoine and Pfah	63.3	85.3		
Bonte	4.8	20.7	30	31.6
Perry	37.5		35	32.4

**Degree of malignancy.** Stimulated by the work of Broders on the grading of squamous carcinoma according to the degree of malignancy Greenough formulated criteria for estimation of the degree of malignancy of breast cancers. He said: "Loss of differentiation and increasing malignancy are indicated by loss of glandular architecture and absence of secretory activity. With increasing malignancy we see also variation in the size of cells and of nuclei, increase in mitotic figures, and hyperchromatism." On the basis of these changes, 3 degrees of malignancy were established on histological grounds and a very definite correlation with prognosis was established. Other writers who have undertaken such a study were able to confirm this correlation.

Degree of Malignancy	Greenough Per cent	Smith & Bartlett Per cent	White Per cent
Low:			
Glands not involved	8	83.8	91
Glands involved	30		30
All cases	68		64
Medium:			
Glands not involved	43	66.7	83
Glands involved	3	5.9	5
All cases	33	4	47
High:			
Glands not involved		60	
Glands involved		6.9	
All cases		3.6	

Patey and Scarff analyzed a series of 50 cases and arrived at substantial confirmation of the experiences outlined. They pointed out that highly malignant growths are rarely found without axillary involvement but that in cases presenting these conditions a cure may be expected. Thus, of their patients with Grade 3 malignancy 5 were living and apparently well from three to seven years after operation. On the other hand of their late operable group only 1 patient out of 15 was living and well at the end of three years. Therefore even in cases of the latter type a low grade of malignancy is not of great favorable significance. They concluded that determination of the degree of malignancy is of most prognostic importance in cases with early axillary involvement.

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found that a five year cure was obtained in 69 per cent of the cases of the lowest grade, 34 per cent of those of medium grade and 4 per cent of those of the highest grade. Ewing, grading the same tumors according to histological criteria, did not secure the same degree of correlation with results.

The Lee and Stutenborg method of grading malignancy seems unnecessarily elaborate and complicated. The arbitrary weighting of the factors, the omission of several factors which undoubtedly have considerable importance, such as pregnancy and a previous non-radical operation, and the apparent reluctance to use histological findings which are obviously of significance (even though such inclusion would make the index less "clinical") tend to limit the usefulness of such a scheme. The method was the outcome of the conviction that too much attention was being paid to histological criteria, but it is doubtful if even the most ardent microscopists are willing to venture a prognosis without full information and evaluation of all of the clinical aspects of a case.

The value of the clinical index is reduced also by the fact that it does not permit comparisons between different clinics because the individual factors, age groups, etc. may vary considerably and yet, by reciprocal variations in other factors an identical numerical index might be reached.

**Previous non-radical operation.** It is commonly held that the prognosis is much impaired if a previous non-radical operation has been done. Harrington presented figures in support of this view

	Alive 5 years Per cent	Alive 10 years Per cent	Alive 15 years Per cent
Glands not involved:			
Primary radical operation	80.3	67.4	34.8
Secondary radical operation	61.5	62.5	33.3
Glands involved:			
Primary radical operation	4.7	5.8	1.1
Secondary radical operation	10.5	10.3	8.3

Harrington pointed out further that in the primary radical group the cases with glands involved formed 65.8 per cent of the total number, while in the secondary radical group they formed 78.6 per cent of the total number. Unfortunately the data in regard to the elapsed interval were not given. Bloodgood, Peck and White and others felt that if the secondary radical operation followed promptly after the incomplete operation, i.e. within a week the results would not be appreciably poorer than those of primary radical operation.

**Other breast.** McWilliams collected 3,123 cases of cancer of the breast by means of a questionnaire. In 154 (5 per cent) the cancer was bilateral. In 93 cases operation was done on the sec-

ond breast. In 11 (0.3 per cent) of the latter both breasts were involved simultaneously and in 87 one breast became involved after the other. Because of the absence of metastases elsewhere, the occasional histological dissimilarity of the tumors, and the relatively satisfactory prognosis of the second operation, McWilliams believed that these cases represented cancer originating *de novo* rather than a recurrence.

Of the patients who developed cancer in both breasts simultaneously 5 were living and well from one to twenty two years after operation.

Of the 87 cases in which one breast was involved after the other the second operation was performed within one year after the first in 25 (28.7 per cent) within two years in 42 (48.3 per cent) within three years in 56 (64.3 per cent) and within five years in 69 (79.3 per cent). The prognosis seemed to be poorest in the cases in which less than a year elapsed between the operations.

The results in McWilliams series were as follows:

	After first operation		After second operation	
	No.	Per cent	No.	Per cent
Living 5 years	65	74.4	53	57.0
Living 5 years	47	54	8	8.1
Living 10 years	3	3.6	13	7.1
Living 15 years	0	0	9	10.3

Kilgore advocated prophylactic amputation of the second breast some time after the first operation. He presented the following tables:

Years after first operation No.	Patients living No.	Patients eventually developing cancer in other breast	
		No.	Per cent
1	0	1	7.3
2	95	9	9.5
3	60	5	8.3
4	1	1	10.0

If prophylactic mastectomy had been done	Patients living	Lives which would probably have been saved
At time of 1st operation	640	
5 yrs. after 1st operation	37	10
5 yrs. after 2nd operation	25	6

Greenough, discussing this paper, cited a series of 35 cancers of the second breast, only 5 of which developed as late as three years after the first operation. Six of the 35 were interpreted as the first sign of recurrence of the original tumor. In 19 there was also a recurrence elsewhere.

Kilgore presented end-results of operations on cancer of the second breast showing an incidence of five year cure ranging from 20 to 30 per cent.

which was very like the incidence of such cures obtained in primary cases. He pointed out that the second cancer developed mainly in cases in which the primary breast tumor was confined to the breast and there was no axillary involvement. This is obviously because patients with such primary breast tumors lived long enough to develop subsequent involvement of the other breast.

Without laboring the point it is clear that cancer can arise as a new process in the other breast either simultaneously or subsequently, and that the results in these cases are not essentially different from the results in primary cases. It is probable that, recurrences being ruled out, the incidence of this reoccurrence of cancer is in the neighborhood of 5 per cent.

Trout quoted Sistrunk as saying in a letter, "For some time I have felt that when a patient has cancer in one breast and a definite mastitis in the other, both breasts should be removed."

Trout inquired into the effect of pregnancy after operation for cancer of the breast. In reply to a questionnaire he obtained the records of 15 patients with subsequent pregnancies, during which 13 developed cancer in the remaining breast. Of the latter, 12 died very promptly. The interval between operation and reoccurrences associated with pregnancy varied from two to ten years.

Obviously such a questionnaire will collect more than a fair proportion of recurrent cases, it is possible that a great many patients who had no recurrence could not be traced. But equally obviously, a subsequent pregnancy carries a grave hazard and should be permitted only under rare circumstances.

#### RECURRENCES

*Time of recurrences.* Pfahler and Widmann reported that the average time from operation to the appearance of recurrence in 255 cases was one year and four months. Fifty-six per cent of recurrences developed within six months. Bunts stated that 28.5 per cent of recurrences occur within the first six months. Perry reported that 14 per cent of the recurrences in his cases developed within six months, 40 per cent within a year, and 70 per cent within two years. Of Roux-Berger's recurrences, 65.2 per cent developed within one year after operation. Dahl recorded the development of 71.4 per cent of his recurrences within three years. Of 53 regional recurrences reviewed by Evans and Leucutia, 32 appeared within one year and 6 from five to twelve years after operation. Gage and Adams stated that of 39 regional recur-

rences, 23 appeared within from six months to a year after operation. On the other hand, Woolsey collected 51 late regional recurrences occurring up to twenty-five years after operation, over 45 per cent of which developed between seven and ten years after operation. Steward reported a case of recurrence thirty-one years after operation. Ransohoff (quoted by Woolsey) reported 26 regional recurrences developing seven or more years after operation. These occurrences are unusual enough not to invalidate Scott's contention that three-year freedom from local recurrence should be the measure of success of operative technique as regards the extent of operation.

*Sites of recurrence.* Local recurrences, as intimated, may be considered evidence of an inadequate operation or of disease so extensive as to be definitely inoperable. The data of Pfahler and Widmann on the time of recurrence probably refer to local and regional recurrence. Sistrunk and MacCarty stated that "when local recurrence develops, other remote metastases are demonstrable in 60.9 per cent of the cases." In their series there were 9 local recurrences after 218 operations. In contrast with this low incidence, Meier recorded 57 local recurrences in 171 operations.

Of a series of 267 cases, the majority probably late cases, which were reviewed by Carnett and Howell, complete X-ray studies of the skeleton were made in 204. One hundred and one (49 per cent) of the latter showed bony metastases distributed as follows:

Cervical vertebrae	10	Skull	14
Thoracic vertebrae	47	Pelvis	45
Lumbar vertebrae	44	Femora	32
Legs	7	Forearm	6
Hand	4	Shoulder girdle	44
Foot	4	Ribs	35

The general distribution of recurrences in a number of series of cases is recorded in Table III. As these are largely selected series, they are not representative of the usual distribution of metastases. Many of them were collected by roentgen therapists who obviously have a larger percentage of local and accessible recurrences to treat. On the other hand, few cases of abdominal involvement are referred for therapy unless other metastases co-exist. Finally, a complete skeletal study is only rarely carried out although it usually shows a considerable incidence of skeletal disease.

Moschowitz described the clinical picture and histology of foreign body reactions about catgut knots which may be mistaken for recurrences in the operative area.

TABLE III.—DISTRIBUTION OF RECURRENCES

Author	Cases in series No.	Recurrences No.	Operative area %	Anast. %	Intra-operative glands %	Thorax %	Abdomen %	Other largest %	Other anast. %	Spine %	Hip %	Other bones %	Brain %
Breast	177		30	7									
Breast		72	95					7	3				
Carter	54	21	80		3	23	54	3	3	21	80		
Dahl	3		80	10	10	—							
Evans & Linscott		7	—			—							
Lee & Cornell		60	10	20	11	10	9	3	3	17		3	
Lee & Tannenbaum		36	10	80	10	10		3	0			3	
Perry	621		—			34	80			3			
Ross-Burger		21	10	54	10	—							
Rotchick		97	—			11.9		6		—			3.

**Treatment of recurrences.** It is apparent that most surgeons are willing to operate for the removal of small movable recurrences in the operative area. As a rule an operation for this purpose is supplemented with intensive radiation therapy. Operations for recurrences fixed to the chest wall are rarely justified although they are occasionally performed (See section on operative technique). All other recurrences now belong without dispute in the field of radiation therapy which will be discussed later.

#### PATHOLOGY

Bloodgood has repeatedly presented his classification of non-encapsulated tumors of the breast, as follows: (1) comedo-adenoma and cancer, (2) colloid carcinoma, (3) scirrhous carcinoma, (4) medullary carcinoma, (5) cylindroma, and (6) cancer cyst. He pointed out how difficult it is to distinguish microscopically between an encapsulated adenoma and carcinoma, and emphasized the necessity for careful gross examination as well as an examination of frozen sections. He recently presented a careful study of border line tumors.

Lee and Tannenbaum gave a detailed description of the inflammatory type of cancer of the breast from a clinical and pathological viewpoint. Cheate and Cutler described gelatinous cancer.

MacCarty urged simplification of pathological terminology for breast conditions, suggesting that all breast epithelial tumors might be described as of primary secondary or tertiary differentiation. In another paper he presented a very interesting summary showing the diagnostic efficiency at the Mayo Clinic. Of 100 breast cases, 51 per cent of which were cases of cancer

the clinical diagnosis was doubtful in 21.5 per cent and the pre-operative diagnosis of cancer was confirmed pathologically in 91.5 per cent. Of the pre-operative diagnoses of benign lesions, 83.3 per cent were confirmed pathologically. Cancer was found in 4 per cent of cases diagnosed benign. Microscopic diagnosis was necessary in 13.3 per cent of the whole series.

#### END-RESULTS

There has been so much confusion in reporting end results that it is practically impossible to combine or compare series from different clinics or even those reported from the same clinic at different times. Various methods and proposals for uniformity have been suggested and it is to be hoped that something may come of them. Perry offered a method of reporting the number of survivors of each successive year period with the percentage they represented of the total number. This method is certainly clear but as it includes survivors alive with recurrent disease as well as patients dead from intercurrent disease it is inaccurate. Moreover it probably includes untraced patients among patients dead of the disease. However, several other clinical reports appear in about this form. Meier discussed at length various statistical methods of reporting end-results. The method adopted by Greenough for presenting his figures has found considerable favor. It would seem desirable for Greenough's table to include separate lines for reporting the different results in cases with and without axillary involvement.

Table IV is a collection for comparison of the gross figures from numerous clinics for five year end-results. In some instances the figures avail-

able permitted division of the cases into those with and those without gland involvement. The accuracy of this table is impaired by the fact that many of the operations reported were not typical radical operations. Operability criteria varied widely, in part because of variations in pre-operative study, especially with the X-ray. In some of the cases intensive X-ray therapy was given both before and after operation. The so-called "cures" in several of the series included survivals with recurrence.

The classification of the extent of the disease required on the summary cards for cancer of the breast sponsored by the American College of Surgeons is only gradually coming into use. The European clinics employ chiefly Steintal's classes or some modification thereof.

It is evident from practically all available data that the presence or absence of axillary involvement is one of the most significant clinical factors affecting the prognosis. The Steintal classification is not clear cut in regard to this factor. Thus tumors belonging to Steintal's Group 1 are characterized as local processes smaller than a plum, without obvious axillary metastasis, and those belonging to Group 2 as processes larger than a plum, with involvement of the overlying skin and the axillary nodes. It is, for example, not at once clear where tumors smaller than a plum, with axillary node involvement, should be classified. This classification has brought much order to reports from European clinics, but the reported number of operative cures obtained in cases belonging to Steintal's Group 3 (supra-clavicular area involved) suggests that classification is difficult and unsatisfactory. In general we have assumed for purposes of comparison that Steintal's Group 1 coincides with Group 1A (axilla not involved) of the American College of Surgeons classification, and Steintal's Group 2 with Group 1C (axillary nodes involved) of the latter classification.

If the classification of primary cases is confusing, that of other cases is even more so, and the difficulty is increased by combining radiation and operation, palliative or radical, in the treatment of recurrences or as a prophylactic measure. A forward step has been made by the introduction of the summary cards of the American College of Surgeons for this and other types of malignancy. The use of these cards permits the assembling of large numbers of cases and the presentation of unified statistics.

*Comment on table.* It seemed desirable, by weighting the percentages of five-year cures with the number of cases in the series, to determine

TABLE IV—END-RESULTS OF OPERATION WITH OR WITHOUT X-RAY TREATMENT

Author	Cases No	5 year "cures," not in- glands involved Per cent	5 year "cures," glands involv- ed Per cent	5 year "cures," all cases Per cent	10-year "cures," all cases Per cent
Brattstrom	256			23	31
Bunts	867			24 1	9 5
Crile	573			37 4	15 8
Hintze (Operation alone)	587			35	20 8
Hintze (Operation + X-ray)	247			55 9	33
Harrington	2038			25 8	8 2
White	213			36	24
Wyand	560				14
Anschutz and Hellman (Operation alone)	116			35 3	
Anschutz and Hellman (Operation + X-ray)	215			44 4	
Black	60			30	
Brahe	?	46	18 8	31	
Buchanan	247			29	
Dahl	83	66 6	15 8	24 5	
Evans and Leucuba	62	70	46 6		
Faure	46			23 2	
Gibson	75			18	
Greenough	100	62	26	27	
Grenade	86			28	
Hartmann and Bergeret	251			19	
Jennings	72			25	
Lee and Cornell	75			15	
Linder	117			17	
Mills	118	62	18	39 8	
Morton	80			31	
Moschcowitz et al.	89			34	
Peck and White	101			39	
Pfahler and Widmann	801	77	38		
Primrose	51			44 4	
Sadler	70			24 3	
Schmidt	19			53 2	
Schoute and Orbaan	78			35 9	
Sistrunk	218	64	19		
Smith and Bartlett (Radical operation)	123			37	
Smith and Bartlett (Palliative operation)	33			36 7	
Wintz	300			48 5	

the five-year cure percentage for the whole group. In 7,974 cases so assembled the incidence of five year cure was 30.6 per cent. In cases without axillary node involvement the reported incidence of five-year cure ranged from 62 to 70 per cent with 2 exceptions. In cases with axillary involvement the percentages ranged from 15.8 to 26 with the exception of 2 radiated series.

It is interesting to compare this gross curability of surgically treated cases with the figures assembled by Jacobsen in 1918. In a total of 3,462 cases, Jacobsen found the incidence of five year cure to be 33.7 per cent. It is interesting also to compare Greenough's report for the American College of Surgeons in 1929. Of 335 cases in which a radical operation was done, a five year cure was obtained in 29 per cent. In the cases without axillary involvement the incidence of five-year cure was 57 per cent, and in the cases with axillary involvement it was 26 per cent.

It would be highly desirable for reporting authors to indicate total entries and the percentage of operability in their series as from such data it would be possible to obtain a figure indicating the gross curability. This figure would vary widely depending on the nature of the clinic reporting. In the few reports from general hospitals which cover this point the radical operability in primary cases is about 75 per cent.

#### RADIATION

*Prophylactic radiation.* The evaluation of prophylactic radiation, pre-operative and postoperative, is difficult. The techniques of radiation have changed so frequently that it is rare for a given clinic to report a successive series of cases receiving the same type of treatment. In many cases accurate pathological examination of the tissues is wanting and the follow-up is rather more unsatisfactory than in a simple surgically treated group.

Table V presents data collected from the published series. Here again Steintal's Groups 1 and 2 have been assumed to indicate freedom from, and the presence of axillary involvement, respectively.

*Comments on table.* It should be realized that of the 22 entries in the column, only 7 were published more recently than 1927. Since five year results are recorded, the type of X-ray therapy was that in vogue at least ten years ago. A survey of the columns clearly indicates a definite advantage in favor of prophylactic radiation.

The important recent exception, excluding Perthes early Tuebingen series, is Greenough's

report embracing the results from numerous clinics assembled by him for the Committee on the Treatment of Malignant Diseases with Radium and X-Ray of the American College of Surgeons (Chart I). Greenough concluded that "These figures fail to indicate that the use of prophylactic X-ray as practiced in this series increases in any way the number of cases of cancer of the breast which are free from recurrence five years after operation." Postmann had a later series which is not included in the table because only three-year results were known and these showed unfavorably for prophylactic radiation. Postmann used a different technique, which he has since abandoned to resume his earlier method. Macrae recorded that he was opposed to prophylactic radiation, chiefly because of the experiences in Marburg, Tuebingen, and Leipzig (Kastner's clinic). Jungling concluded after a careful analysis of the Tuebingen and Kiel results that "In Tuebingen X-ray has certainly done no good and may possibly have done some harm. At Kiel it did no harm and probably was slightly beneficial." Hiltze stated that in his opinion the poor results in the Tuebingen and Leipzig series might be attributed to the general debilitated state of the postwar population of Germany at the time the series were treated.

Evans and Leucuth were of the opinion that prophylactic X-ray treatment improved the results in cases with axillary node involvement. Wintz believed that in cases belonging to Steintal's Group 2 the results of radiation were better than those of surgery. Harrington, although his figures showed favorably for pro-

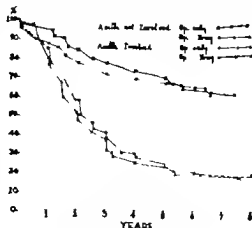


Chart I. Survival after operation (Greenough)

TABLE V—PROPHYLACTIC RADIATION

Author	Number of cases			Five year cures (per cent)					
	Not radiated	Radiated	Total	Glands not involved		Glands involved		All cases	
				Not radiated	Radiated	Not radiated	Radiated	Not radiated	Radiated
Anschutz and Hellman	116	215	331	100	100	35	57	35 3	44 4
Antoine and Pfab			160					30	48 1
Braine			?					27 3	31
Buchholz			358	100	100	47	72	22 3	45
Evans and Leucutia			62		70		46 6		
Greenough	220	115	335					33	23
Gunsett			124		16		11		20
Harrington			203 <sup>52</sup>		91			35	55 9
Hintze	587	247	834						34 2
Lee and Herendeen			95					28	39
Lehmann			75						17
Linder			101		77		38		
Pfahler and Widmann			217	61 1	65 9	21 6	25 8		
Portmann								23 1	35 8
Schoute and Orbaan			71 <sup>7</sup>					35 9	44 4
Simon and Wollner			19	100	100	50	50		
Smith and Bartlett			88					30 5	72 2
Wintz			300						45 5
Kiel (Quoted by Simon and Wollner)								37 9	57 3
Rostock (Quoted by Simon and Wollner)								28	39
Marburg (Quoted by Simon and Wollner)								20 9	31 8
Tuebingen (Quoted by Simon and Wollner)								27 7	20

phylactic radiation, concluded that "roentgen-ray treatment has not been of great value as an auxiliary to operative treatment of these cases. If the radical operation is performed, it should accomplish complete removal of the diseased tissue and should not depend on the roentgen ray to destroy remaining malignant tissue."

*Effect on local recurrence* In keeping with this opinion, it is difficult to see how postoperative radiation of the operative area can do more than prevent local recurrence.

Greenough could not establish from his series that local recurrences are delayed or decreased. Lehmann found the same percentage of recurrences (local?) in his radiated as in his non-radiated series, although his end-result figures show that a five-year cure was obtained in 35 per cent of the radiated cases and in only 28 per cent of the non-radiated cases. Portmann quoted

Pertes to the effect that in the first year post-operative recurrences are more frequent in the radiated than in the non-radiated group. His own experience bore this out as a recurrence or metastasis developed during the first year after operation in 16.5 per cent of his cases in which no radiation was given, 29.3 per cent of those in which light radiation was given, and 35.1 per cent of those in which intensive radiation was given. Quite different were the findings of Evans and Leucutia, who had only 1 case of local recurrence in a series of 65 radiated cases, whereas of 74 recurrences in the same clinic, 53 were local. Schoute and Orbaan reported that a local recurrence developed in 34.3 per cent of their non-radiated series—surely a reflection on the operative technique or the selection of cases—as contrasted with 14.3 per cent in their radiated series.

**Technique** The technique of radiation has changed so constantly that it seems wisest to omit detailed consideration. As indicated Portmann cast his vote against intensive radiation. Böckler, Holfelder and Buchholz also rejected the more intensive types of treatment to revert to lighter treatments spread over a longer interval. Linder on the other hand, recommended few intensive treatments in preference to frequent weak doses. Hintze, Pfahler, Lee, Lee and Herendeen, Bowring, Desjardins, and Evans and Lencutia have published detailed techniques of treatment. Doubtless all of these have since been abandoned for still further refinements and modifications. Wintz advised radiation castration as an aid to control of the disease.

**Dangers** Many authors have warned against possible lung damage. Swanberg described in detail with roentgenograms a case of fibrosis of the lung. Desjardins described the clinical picture of pleuropulmonitis and discussed the differential diagnosis of this condition from pulmonary metastases. Wintz and Hintze both warned against the possibility of the occurrence of this condition.

Greenough warned in addition against the development of cancer in areas of radiation dermatitis, and demonstrated the rôle of pre-operative X radiation in defective wound healing.

**Surgical pathology of radiation.** The tissue changes in radiated cases have received a careful description by Lee. After radiation, Bowring found an increase in the defensive factors described by MacCarty. Dupont and Leroux found just the reverse. Smith and Bartlett attempted with some success to demonstrate the relationship of radiation effectiveness to the degree of malignancy of the disease. The percentages of their patients who were alive three, five, and seven years after treatment for medium or high malignancy by operation alone and by operation and X ray radiation are shown in the following table:

Years	Medium malignancy		High malignancy	
	Operation alone	Operation and X-ray	Operation alone	Operation and X-ray
3	68	63.6	6	63.6
5	39.3	6.6	10	30
7	30	4.6	6.9	30

**Classification of cases treated by radiation** Evans and Lencutia and Schreiner and Stenstrom have formulated schemes for classifying cases treated by radiation to permit comparisons of series. Lee found it useful to plot on a graph the number of survivors at various time intervals after treatment. This is also the scheme used by

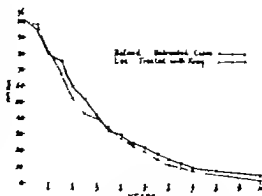


Chart II. Survival from onset.

Daland in recording his untreated series (Chart II).

**Radiation of primary operable cases** Results in this group are bound to be open to question because of the frequent lack of pathological confirmation of the diagnosis. Pfahler reported 43 cases in which 82 per cent of the patients were living after three years and 65 per cent were living after five years. Webster reported 15 cases treated by radiation with favorable arrest in most cases. Buchanan reported the cases of 33 patients, of whom 25 died of cancer. He does not think that the lives of these patients were prolonged. Twenty-five per cent were living and apparently well after three years as contrasted with 35 per cent of patients treated by operation alone. Lee reported a five year cure in 36 per cent of 45 cases treated by radiation with or without palliative surgery. The results in cases treated with the X ray alone were less satisfactory than those in cases treated with radium alone or combined with the X ray. Wintz reported 306 cases with results as follows:

Stadthol's classification		Cases treated		Three year cure per cent	
		No.			
Group 1					95.8
Group 2		4			68
Group 3		44			8
Stadthol's classification		Three year cure %	Five year cure %	Five year cure %	Seven year cure %
Groups 1 and 2		77	65.9	48.5	37
Group 3		8	5	5	30

These cases were controlled by pathological examination and untreated patients were counted as having died of cancer. On the basis of these figures Wintz concluded that cases of Steinfeld's Group 2 should be treated by radiation rather than by surgery.

**Radium** A few reports deal with treatment with radium as opposed to X-ray. Kirkendall had treated 817 cases of all classes. He reported no end-results, but was most enthusiastic about radium treatment. Bowing described the technique of radium therapy used at the Mayo Clinic, and Keynes the interstitial use of platinum-filtered radium. Handley combined radium implantation with radical operation and believed that he improved his results considerably by so doing. Lee reported 11 primary operable cases treated with radium. Sixty per cent of the patients were living and apparently free from disease five years after the treatment. Lee thought that the results obtained with platinum-filtered implants were better. In a follow-up of 633 cases in which he used chiefly filtered radium, Ward found that 112 (22 per cent) of 510 patients were alive after three years, 51 (12.6 per cent) of 405 patients were alive after five years, and 5 (6.1 per cent) of 82 patients were alive after ten years. In addition, 40 per cent showed marked temporary benefit. Of the entire series of cases, 74 per cent were postoperative recurrences, and of the latter, 46 per cent were supraclavicular. From this fact Ward concluded that operation had been offered in many cases that were too advanced. He thought that a technique of radiation recently adopted would yield even better results.

**Radiation in recurrent and inoperable cases** In cases of local operable recurrences Pfahler secured a three-year cure in 69 per cent and a five-year cure in 54 per cent by X-ray treatment. In 239 advanced recurrent and inoperable cases he obtained a three-year cure in 38 per cent and a five-year cure in 12 per cent. The duration of the condition in fatal cases in this series was as follows:

Average time from onset to operation	1 yr, 5 mos
Average time from operation to recurrence	1 yr, 4 mos
Average time from X-ray treatment to death	2 yrs, 9 mos
Total	5 yrs, 6 mos

Of 126 patients with advanced primary inoperable lesions, 41 per cent were alive after three years and 20 per cent after five or more years. Of these, 73 per cent showed X-ray evidence of metastasis in the chest or bones when the treatment was begun. The average duration of life from the onset of the lesion to the start of treatment was twenty-one months, and the average length of time from treatment to death three years and four months, the total duration being therefore five years and one month.

Lee recorded the average duration from the onset of recurrence to death as two years and

four months in a radiated series of cases, whereas in a non-radiated series of cases reported by Gibson the corresponding length of time was six and one-half months. Lee published a series of 133 inoperable cases treated with radiation, comparing them with Daland's 100 untreated cases. The 2 survival curves were practically identical. However, Lee pointed out that the average age in his group was less than that in Daland's group and hence the prognosis should have been poorer. He concluded that X-ray therapy in this group relieves pain, heals ulcers, improves the general condition, and in some instances prolongs life. He gave three years as the postoperative duration of fatal non-radiated cases, as contrasted with three years and nine months in cases receiving pre-operative and postoperative radiation and four years and six months in cases treated by radiation alone. Of 54 inoperable patients whose cases were reviewed by Lee, 10 were living three years after the beginning of treatment, and of these 10, 4 showed no evidence of disease. Lee concluded that patients with recurrence who are treated by radiation live longer than those not receiving radiation.

Schoute and Orbaan reported a case of recurrence with abdominal and pleural metastases which was apparently cured by X-ray radiation.

#### CONCLUSIONS

It is evident that about 30 per cent of all radical operations result in a five-year cure. Recurrences continue for a much longer time and the cures fall off year by year. In cases without axillary involvement the incidence of cure approaches 70 per cent. *A priori* it would seem that postoperative radiation would diminish local recurrences. How it could affect already established metastases not in the radiated field is difficult to conceive. Many of the reports most enthusiastic for prophylactic radiation come from clinics where there is a very high incidence of local recurrence. On the other hand Greenough found no influence on local recurrence in a radiated series of cases. However, the radiation technique used in this series was antiquated and is no longer followed. It must be concluded on the evidence available that prophylactic radiation improves the results of operation.

The evidence for radiation of operable cases in preference to operation is conflicting. Wintz's series is the most significant. Results from other clinics do not bear out his findings.

All are agreed that radiation is indicated in the treatment of inoperable primary and recurrent cases. Whether radiation prolongs life in this



group is debatable. What little evidence there is seems to show that it does.

The details of radiation, whether pre-operative or postoperative, or both, whether given with the X-rays or radium or both are still matters to be worked out. As suggested probably most of the radiation techniques employed in the series of cases here cited have since been abandoned.

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group is debatable. What little evidence there is seems to show that it does.

The details of radiation, whether pre-operative or postoperative, or both, whether given with the X rays or radium or both are still matters to be worked out. As suggested, probably most of the radiation techniques employed in the series of cases here cited have since been abandoned.

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ever, the fluid in solution in the gel of the vitreous protein is of the same nature as that of the aqueous.

The retrolental dark space is proved to contain primary vitreous humor since it is demonstrated to be the anterior portion of the canal of Cloquet. The "moiré" curtain at the posterior wall of the retrolental space is nothing else than the condensation layer separating the primary and secondary vitreous.

Liquefaction of the vitreous undoubtedly represents a lysis of the colloidal gel. This may possibly be effected by an enzyme action producing digestion of the ultramicroscopic micelles. The typical normal appearance is replaced by a condition presenting a variety of formations which probably represent aggregations of the ultramicroscopic fibrils into dots, nodes, and fibers of a higher refractive index. These appear as if suspended in a fluid of varying degrees of viscosity. Floating membranes may thus occur without fibroblastic invasion of the vitreous.

Particulate bodies in the retrolental space behave as if they were enmeshed in a gel such as the vitreous is conceived to be. Such bodies, except for developmental remains, may always be considered indicative of a pathological condition. In nearly every case of iritis, cells and debris may be found in the retrolental space at the same time that they appear in the anterior chamber. From this standpoint cyclitis is undoubtedly coincident with iritis. In cases of suspected cyclitis or uveitis, the retrolental space should always be examined for cells. In choroiditis, cells may reach the retrolental space through the vitreous from the posterior lesion. Clearing of the retrolental space of cells and debris is undoubtedly accomplished in the same manner as in the rest of the vitreous by a process of lysis and digestion and phagocytosis by the tissue macrophages. In all cases of detachment of the retina with a tear and in cases in which a tear has been suspected, reddish brown, lustrous pigment granules exfoliated from the retinal pigment epithelium of the area of the tear have been observed in the retrolental space.

After operation on the lens in which the posterior capsulozonular structures are left intact, the relations in the retrolental space remain unaltered. After uncomplicated intracapsular extraction of the lens there is to be observed a delicate condensation layer of so called hyaloid limiting the anterior vitreous and an area corresponding to the retrolental space. Posterior to this space, the typical "moiré" curtain that is normally seen at the posterior border of the retrolental space may be observed in a certain number of cases. In the elderly partial liquefaction of the vitreous is common. Therefore normal appearances are not preserved in all cases after operations for cataract. After the discussion of secondary cataract division of the anterior condensation layer is the rule and herniation of the vitreous through the pupil is common. Even in this condition there appears an intact line of separation from the aqueous produced by the difference in surface tension of the aqueous and vitreous.

The author's conclusions are as follows:

1 There is a condensation (hyaloid) layer representing aggregations of ultramicroscopic micelles limiting the vitreous anteriorly.

2 This layer is in apposition with the posterior lens capsule except for a capillary space that contains a fluid which is presumably like the aqueous, but is kept practically obliterated by the intravitreal pressure.

3 The retrolental space, limited anteriorly by the anterior condensation layer and posteriorly by the wall of the canal of Cloquet, contains primary vitreous.

LESLIE L. MCCOY, M.D.

## EAR

Fernández, A. A. Painful Nodules of the Ear (Nódulos dolorosos de la oreja). *Semana méd.*, 1931, *xxxvii*, 1693.

A man thirty-eight years of age sought treatment for small nodules along the upper edges of his ears which were so intensely painful that at night he was obliged to lie on his back or hold his ear in the hollow of the palm of the hand to protect it from the pressure of the pillow. The pain irradiated to the rest of his head and his arm.

The nodules ranged in size from that of a pinhead to that of a grain of wheat. The skin over them was a shining waxy white. Over the most prominent part of the larger nodules there were small scales which could easily be rubbed off. When this was done slight hemorrhages occurred.

When the nodules were removed and examined histologically they were found to be formed around an enlarged vessel as an axis. They were made up of smooth muscle fibers, epithelioid cells, collagenous tissue, and amyelinic nerve fibers. They were apparently neuromyo angiomas analogous to the tumors found by Masson beneath the finger nails. Similar neoplasms have been discovered on the forearm and thigh. They may occur in any tactile area of the skin, but are most common in the areas where tactile sensation is most highly developed.

AUDREY GOSS MORGAN, M.D.

## NOSE AND SINUSES

Pfahler, G. E. A Demonstration of the Lymphatic Drainage from the Maxillary Sinuses. *Am. J. Roentgenol.*, 1932, *xxvii*, 352.

Pfahler reports the case of a man with enlargement of the lymph glands of the neck who was referred to him for treatment with the diagnosis of lymphosarcoma. On further study the glands were found to be inflamed. There was some infection of the lymphatic tissue of the region from which the tonsils had been removed. The tonsillar areas and all of the involved lymphatic areas were treated by irradiation. Complete recovery resulted.

About ten weeks before the patient was seen by Pfahler his maxillary sinuses had been injected with hypodol. When Pfahler examined him the left antrum was completely empty, but on the right side

# ABSTRACTS OF CURRENT LITERATURE

## SURGERY OF THE HEAD AND NECK

### XYZ

Fischer Aschner M.: The Etiology of Trachoma  
(Zur Ätiologie des Trachomas) *Arch. f. ophth.*,  
93 d 44

The author made examinations for the bacterium granulosis in sixty clinically definite cases of trachoma in various stages and five clinically definite cases of follicular catarrh in children. In eleven of the cases of trachoma it was possible by the methods of Noguchi to isolate a mottle, not constantly gram-negative bacillus. After a few days a marked mucous formation and sometimes a distinct yellow color appeared in the glassy small gray colonies. Subculturing was successful six times with re-inoculation once a week. The strains were obtained from recent untreated cases of trachoma without cloudfix formation and without pannus. Often, however, the strains died out before the fourth generation. This was attributed to the sensitiveness of the micro-organisms to variations in the nutrient medium.

Investigations with regard to complement fixation and agglutination with the serum of patients with trachoma showed, just as in normal controls, a negative result. Because of the formation of mucus the strains are not suitable for complement fixation. In the agglutination experiments it was found that all of the strains were spontaneously agglutinable. Moreover in cases of trachoma no hypersensitiveness to the micro-organisms mentioned was demonstrable by cutaneous, intracutaneous, or subcutaneous inoculation with a vaccine prepared from these organisms. In experiments on eight moccasin rhesus monkeys a chronic conjunctivitis occurring in attacks and associated with the formation of superficial follicles and papillary hypertrophy was produced in two of the animals with a mixture of strains of the bacterium granulosis obtained from the Rockefeller Institute. However this conjunctival disease did not correspond to human trachoma in its character or course. It resembled more closely the spontaneous folliculosis of monkeys. In the cases of both animals the bacterium granulosis could be recultured from the conjunctiva. An experiment on animals carried out with a strain cultivated by the author himself was negative. The author concludes that we cannot deny the etiological importance of the bacterium granulosis inasmuch as the negative experimental results may have been due in large part to resistance of the monkeys or low virulence of the bacterial strains.

Rosenheim (O).

Kirby D. R.: The Anterior Vitreous in Health and in Disease. *Arch. Ophth.*, 1932, VII, 247

A study of the anterior vitreous of the human eye in health and disease was undertaken to correlate the existing knowledge concerning the so-called hyaloid membrane and retrolental space and to answer some of the disputed questions concerning structures and relations in this area of the human eye.

Embryological studies by Mann demonstrated that the anterior vitreous consists of the primary vitreous, which is directly posterior to the crystalline lens in the adult, and the secondary vitreous, which is separated from the primary vitreous by a condensation layer representing the wall of the canal of Cloquet.

The layer known to surgeons as the "hyaloid layer" has been described by anatomists as being in apposition with the posterior lens capsule except for a capillary space, but this conception was rendered doubtful by slit lamp microscopists who found a retrolental dark space uniformly in normal eyes.

Examination of the vitreous with the aid of polarized light demonstrates that there is no structureless membrane in or surrounding the vitreous. Ultra-microscopic examination led to the hypothesis that the vitreous is a gel without fibrous structure. The appearance of fibrils or curtains is the result of the superimposition of numerous ultramicroscopic micelles. The structures of curtains that are seen in the normal vitreous are therefore condensation layers. The most anterior of these must represent the so-called hyaloid layer and is to be found directly back of the posterior lens capsule, separated from the latter by only a capillary space and kept in apposition with the posterior lens capsule by the intravitreal pressure.

Observation of the region of the posterior lens capsule both directly and with the specular reflex, discloses a fibrillar layer posterior to the capsule. The arc line and other remnants of the branches of the hyaloid artery may be found attached to this fibrillar condensation layer. They are attached to the lens capsule only secondarily through the intimate contact of the anterior condensation layer with the lens capsule at its periphery.

The visibility of the outstanding beam through the retrolental space proves that this space is not optically inactive. The fact that the visibility of this beam is greater than that of the aqueous proves that the retrolental space contains colloid which is different from that of the aqueous humor. The latter does not exist as such in the retrolental space. H. W.

but the symptoms remain in 5, and no improvement has been noted in 4. Von Eiken believes that Coutard's method and his own technique of applying radium after surgical intervention promise improvement in the results in carcinoma of the hypopharynx.

COLLEDGE states that in early cases without vocal cord paralysis lateral pharyngotomy is the ideal operation and in advanced cases the Gluck operation is justifiable. In cases unsuitable for operation radon seeds may be implanted.

HARMER reports that he has treated 106 patients by radiotherapy. The poor results he attributes to improper selection of the cases and inadequate dosage. He hopes that a better technique and more thorough irradiation will give relief in a larger percentage of cases of inoperable growths.

CADE states that the choice of method depends upon the site, extent and type of the disease. Epilaryngeal growths should be treated with radium in preference to surgery, postcricoid growths, by surgery when possible, and pyriform fossa growths with split doses of massive quantities of radium. In all cases preliminary X-ray treatment is indicated.

MOLLISON says that he favors deep X-ray treatment for postcricoid growths.

HUNTER emphasizes the importance of a most careful examination because the symptoms of carcinoma of the hypopharynx are often vague. He states that on indirect examination a pool of mucus behind the larynx or oedema of the arytenoids may be seen. Valuable information may be obtained by digital examination. In doubtful cases direct examination is necessary. GEORGE R. McATULIFF, M.D.

Macmillan, A. S. Pouches of the Pharynx and Oesophagus. *J. Am. M. Ass.*, 1932, xcvi, 964.

Following a review of the literature on diverticula of the pharynx and oesophagus and a discussion of the mode of development, incidence, and diagnosis of these pouches, the author reports upon eighteen cases of diverticulum of the pharynx and five of diverticulum of the oesophagus.

Zenker divided diverticula into two types: pulsion diverticula due to pressure from within, and traction diverticula, due to a pull from without. Diverticula of the pharynx are of the pulsion type, whereas those of the oesophagus may be of either type.

The author's eighteen cases of diverticulum of the pharynx constituted less than 2 per cent of 1,000 cases in which treatment was sought for dysphagia. Fourteen of the patients were males. There is no treatment of any value except surgical removal.

Of the author's five cases of oesophageal diverticulum, the diverticulum was found in the upper third of the oesophagus in one and in the middle third in four. The diverticula were of the traction type. Oesophageal diverticula occur with equal frequency in both sexes, but are found in only 0.5 per cent of cases of dysphagia. The chief cause of oesophageal diverticula of the traction type is in-

fection of the tracheobronchial glands. Oesophageal diverticula rarely cause symptoms, and are usually found during X-ray examination for some other condition. No form of treatment is satisfactory.

M. HERBERT BAKER, M.D.

## NECK

Meyer, H. W. Congenital Cysts and Fistulae of the Neck. *Ann. Surg.*, 1932, xcv, 1, 226.

The development of the branchial apparatus in the human embryo begins in the second half of the first month. In the course of the second month the branchial apparatus completely disappears. In the early stages, as the heart descends, the medial ends of the first arch are near each other. These form the lower border of the primary mouth cavity. The second arches are separated to a certain degree, the third more and the fourth even more. Thus is formed a triangle with its apex at the mid-portion of the first arch. This triangle is occupied by the heart. From within, an area formed of three arches, called the "mesobranchial field" is formed. In this area is found an elongated oval, fairly large bent body with its convexity posterior, which Hiss called the "furcula." From the furcula the medial portion of the base of the tongue and the epiglottis develop, and from its lower portion the glottis itself is formed. During further growth the arches grow and tend to meet in the midline. In the later stages each branchial arch and cleft crosses the pharyngeal arch and pouch because the mesial ends of the branchial arches and clefts run forward, upward and orally, while the pharyngeal arches and pouches run downward, backward, and aborally. The bottoms of the clefts and pouches run in different directions and therefore are in contact only for very small areas where small occluding membranes are present.

It is accepted that the following structures develop from the following clefts and arches:

First cleft: external auditory canal and ear lobe.

Second cleft: tonsillar fossa.

Third cleft: thymus.

Fourth cleft: lateral lobes of the thyroid.

First arch: lateral portion of the upper lip, upper jaw, lower lip, and lower jaw, and the body of the tongue.

Second arch: body of the hyoid bone, stylohyoid ligament and muscle, anterior portion of the base of the tongue, and arcus palatoglossus.

Third arch: greater cornu of the hyoid bone, posterior portion of the base of the tongue, and arcus palatopharyngeus.

Fourth, fifth and sixth arches: soft parts in the region of the greater cornu of the hyoid bone.

The position of the entire branchial apparatus in the earlier stages as well as the location of the final rests indicate that this apparatus belongs more to the head than to the neck region. The lower border of the hyoid forms the lower border of all the remains of the branchial apparatus, and nothing below this





A lateral view of the stomach and neck taken ten weeks after the injection of Ipiodol. There was practically no change from a month before.

there was retention of a globule of Ipiodol measuring 1.5 by 1 cm. The roentgenograms showed also small deposits of Ipiodol in the lymph spaces. These were distributed from the syngonia to the clavicles on both sides, but were most numerous in the submental and sublingual spaces. On the left side they could be traced definitely to the thoracic duct, and on the right side to the junction of the jugular and subclavian veins. Examination at intervals revealed little diminution in the amount of Ipiodol over a period of more than a year.

Mahler regards it as noteworthy that some absorption occurred upward as well as downward and that there were no collections in what could be identified as lymph glands. These observations suggest that such drainage passes directly through the glands. Mahler believes that the wide distribution explains some of the difficulties encountered in dissections of lymphatics when metastases has occurred by permeation and accounts for the extensive infiltration and recurrence seen after such dissections.

CHARLES H. HILCOCK, M.D.

### PHARYNX

Hansel F. K.: Malignant Tumors of the Nasopharynx with Involvement of the Nervous System. *Ann. Otol. Rhinol. & Laryngol.* 91: 21, 74.

Hansel reports nine cases of malignant tumor of the nasopharynx with involvement of the nervous system. He states that early diagnosis is often

difficult on account of the small size of the primary growth and the absence of nasopharyngeal symptoms. In the early stages of the disease extranasal symptoms are commonly present. These are usually pain in the eye and the side of the face, toothache, earache, deafness, tinnitus, diplopia, blindness, proptosis, enlargement of the cervical glands, dysphagia, aphonia, hoarseness, and symptoms due to distant metastasis.

The cranial nerves are usually involved extracranially. Those passing through the sphenoid fissure are affected most commonly. The sixth nerve is involved most often and the fifth nerve next most often.

NATHAN N. CROWE, M.D.

Trotter, W., von Elken Hunter J. B., Colledge L., and Others: Discussion on the Treatment of Malignant Diseases of the Hypopharynx. *Proc. Roy. Soc. Med. Lond.*, 35: 43.

TROTTER states that epithelioma of the hypopharynx has 5 common starting points: the ary-epiglottic fold, the pyriform sinus, the lateral wall, the posterior wall, and the posterolateral region. Although these points are not far removed from one another, the growths originating in them differ widely in their symptoms and prognoses and in the treatment they require.

In cases of epithelioma arising from the ary-epiglottic fold, the prognosis is favorable because the growth causes hoarseness and stridor in the early stages and can be removed without causing mutilation. Epitheliomata arising in the pyriform sinus may also be removed easily by excision, but are often overlooked. When the growth is located in the posterior wall an immediate plastic reconstruction by a skin flap is required. Growths of the posterolateral region have a very remarkable peculiarities. They are found as a rule in women; they occur considerably earlier than cancer of the pharynx in men and they are often preceded by dysphagia of many years standing.

Local excision of cancer of the pharynx can be recommended with reasonable confidence only when the patient is edentulous, the growth is still confined to the pharyngeal wall, and the gland involvement is limited. In 8 cases cited by Trotter the average freedom from recurrence after the operation was over eight years. Trotter performs a lateral trans-thyroid pharyngotomy.

VON ELKEN says that as he considers surgical intervention unfavorable in carcinoma of the hypopharynx, he has conducted investigations with regard to radium treatment. He applies radium pack externally as a preliminary to surgical intervention. With this treatment he had remarkable success in a case in which both the true and the false vocal cords were involved. When he employs irradiation in conjunction with surgery he places radium carriers in direct contact with the tumor for three or four days. Sometimes he adds thorium. Of 15 cases treated in this way the tumor has completely disappeared in 3, the tumor has decreased in size

pulse pressure From a large series of determinations the author has derived a formula for computing the basal pulse complex from the basal pulse rate and the basal pulse pressure The values are comparable to those of basal metabolism determinations for adults The formula is not intended as a substitute for basal metabolism determinations except under conditions in which the latter are impossible It is recommended as a confirmatory measure, particularly in the diagnosis of doubtful cases and in checking the course of the disease under treatment

LEO ZIMMERMAN, M D

Elliott, C The Medical Aspect of Thyrotoxicosis  
*Radiology*, 1932, xviii, 549

The thyroid gland functions in conjunction with the other ductless glands and the sympathetic nervous system Under conditions of excessive nervous strain and in the presence of certain chronic infections symptoms of thyroid origin identical with those

of thyroid disease may develop in the presence of a perfectly normal gland In such cases treatment directed toward the control of hyperthyroidism is bound to fail It is safer to defer treatment of the thyroid until the diagnosis is established beyond doubt

Difficulty in diagnosis is experienced also in the cases of thyrocardiacs in whom the manifestations of hyperthyroidism are overshadowed by the cardiovascular symptoms If the condition is permitted to continue long enough, organic myocardial changes may supervene.

A fourth group of cases presenting difficulty in diagnosis are those of hyperthyroid patients who are under partial iodine control Iodine therapy should be withheld until a positive diagnosis is made Hyperthyroid crises may simulate severe general infection, encephalitis, cardiac failure, and acute surgical conditions of the abdomen.

LEO M ZIMMERMAN, M D

line has any genetic connection with the branchial apparatus. All congenital anomalies caused by incomplete retrogression of the branchial apparatus are located in the region above the lower border of the hyoid bone. Therefore most congenital anomalies of the neck do not arise in the branchial apparatus, but have their origin in other causes.

The thymic canal develops from the third pharyngeal pouch and extends obliquely from the lateral pharyngeal wall down to the sternum. From the lower end of the canal the thymus develops as a glandular structure. As a rule the thymic canal retrogresses, but sometimes it persists throughout life. The segments persisting are usually in the lower portion. Rests of the thymic canal may form a fistula or cyst. If the canal persists, a complete fistula will result. Lateral fistulae coincide with the thymus in direction and in histological character. Their walls may be covered with squamous epithelium but also may show ciliated cells.

The lateral thyroid lobes also have a short lateral canal that disappears early in embryonic life. As this canal is analogous to the thymic canal, the assumption seems justified that a fistula or cyst might develop from it.

From the facts reviewed it is evident that the clinical and anatomical characteristics as well as the microscopic structure of lateral cysts and fistulae are closely related to the findings of anatomical examination of the embryo. It must be recognized that lateral cysts and fistulae are closely related to the thymic canal. Therefore they should be called "branchiogenetic" instead of "lateral cysts and fistulae."

The treatment of such cysts and fistulae is surgical. Complete excision is necessary for cure.

The following changes may occur in the walls of the cysts and may be classified as complications:

1. Inflammation. This may form an abscess of the cyst.
2. Blood-vessel changes. These may produce blood cysts following injury.
3. Cystadenoma. This may develop from glandular elements coming from the endoderm.
4. Lymphangioma. This arises from lymphatic elements in the cyst wall.
5. Chondroma. This develops from misplaced heterotopic tissue.
6. Teratoma. There is no explanation for the presence of epithelial structures in the cysts.
7. Carcinoma. In lateral cysts and fistulae of the neck the development of cancer is rare, but in the epithelial rests of the stroma of the branchial system it is not uncommon.

In differential diagnosis it is necessary to rule out lipoma, lymphatic lymphoma, tuberculous lymph node, and metastatic lymph-node carcinoma.

The mid-thyroid anlage develops from the epithelium of the floor of the mouth as a thick-celled strand without a lumen. In its rapid growth the anlage draws surrounding cells into the depth of the mesenchyme. The inherent embryonal charac-

teristics continue in these epithelial rests as they do in the mouth and the rests can grow and develop and change into different types of cysts.

The thyroid anlage divides into halves. The unpaired part of the thyroglossal tract retrogresses and disappears either totally or partially.

The hyoid bone develops in the fourth to fifth week. The body of the hyoid comes into close contact with the already well-developed thyroglossal tract, presses into the tract behind it, subdivides it at certain points, and changes its direction.

The retained rests of the mid-thyroid anlage are epithelial structures from the floor of the mouth and are spread out between the foramen cecum and the mid-thyroid anlage. They are most frequent in the root of the tongue and the hyoid and become rarer the nearer the mid-thyroid anlage is approached. The thyroid particles usually remain as atrophic parts of the gland. The epithelial rests change into cysts which are lined with ciliated, squamous, and mixed epithelium.

Cure requires complete removal of the cyst, the hyoid bone, and the tissues running from the hyoid bone to the foramen cecum. *SARUNT KANX, M.D.*

Jenkins, R. L.: Basal Metabolism. I. The Error of Basal Metabolism Determination and the Normal Range of Basal Metabolism. II. The Basal Pulse Complex. *Arch. Int. Med.* 934, Aug. 18, 35.

The value of basal metabolism determinations depends upon the limits of error of the determination. The first step in the study of this error is the establishment of the range of basal metabolic rates in normal persons. As the zero point differs in different laboratories because of variations in population and in the technique and apparatus used in the determinations, it is advisable for each laboratory to establish its own zero point. This may be done by making determinations on a minimum of twenty-five normal persons or taking the modal point of a very large series of unselected cases.

The normal dispersion is a product of the true normal range and the errors of measurement. This dispersion should be kept at a minimum. The use of the Harris-Benedict standard or the Dreyer standard based on observed weight reduces the normal range as compared with the Anb-Du Bois standard. The error introduced by the standard may be further reduced by comparing two or three standards in all doubtful cases. A definition of the normal range of basal metabolism is necessarily arbitrary. The usual delimitation of the normal range to  $\pm 1$  per cent is probably low even when a good technique is used. This might be supplemented by regarding all cases deviating from  $\pm 1$  to  $\pm 17$  per cent from the zero point as doubtful.

The importance of elevations in the pulse rate and pulse pressure in the diagnosis of thyroid disturbances has long been recognized. In 1924, Read published a formula for the prediction of the basal metabolism from the basal pulse rate and the basal

the occiput. The bone is then trephined and the ventricle punctured. The size of the ventricle can be judged approximately from the amount of fluid withdrawn. The fluid is preserved as its re-injection may be necessary. On withdrawal of the needle the endoscope is introduced through the same tract. When the endoscope reaches the occipital pole of the ventricle the light is lighted and focused on the walls of the ventricle. The folds of the hippocampus are then readily recognized or the veins of the inner and upper wall of the ventricle are seen. When the latter are followed up the glomus of the choroid plexus is reached. This has a very characteristic appearance. When the choroid plexus is followed and the objective turned upward and inward, Ammon's horn can be seen projecting into the ventricle. The fimbria is partly covered by the choroid plexus.

When the frontal part of the ventricles is to be explored the ventriculoscope is introduced from in front through an incision made over the frontal eminence. To enter the third ventricle a lateral approach is used with the illuminating apparatus perpendicular to the orifice of the foramen of Monro. On the lower and external wall of the frontal pole of the ventricle the head of the caudate nucleus with the putamen can be seen. It is recognized from its pinkish-gray color and the large veins that run over it. The upper wall of the ventricle at this point is made up of the corpus callosum.

On completion of the endoscopic examination a roentgenogram is made following the injection of 4 c cm of lipiodol.

This method is indicated for the exploration and treatment of anatomical lesions of the ventricles and for experimental studies of the nuclei by means of stimulation or extirpation.

ANDREW GOSS MORGAN, M D

Alpers, B J., Yashin, J C., and Grant, F C.  
Primary Fibroblastoma of the Brain. *Arch Neurol & Psychiat*, 1932, xxvii, 270.

The authors report a case of primary fibroblastoma of the brain occurring in a man fifty-two years of age. This is the fourth verified primary fibroblastoma of the brain to be recorded. The symptoms were of two years' duration. An encapsulated tumor 4 cm in diameter was removed from a depth of 1 cm in the right motor area. Autopsy performed seventy-two hours after the operation failed to reveal a tumor anywhere except in the brain. The greater part of the tumor had the histological structure of a fibroblastoma, but certain areas presented a peritheliomatous appearance. A large number of the tumor cells were undergoing mitosis.

The authors believe the neoplasm may have been derived from fibroblastic pericytes or the pia membrane surrounding the cerebral blood vessels. They were certain, however, that it had its origin in mesodermal elements either fibroblasts or cells capable of differentiating into fibroblasts.

ROBERT ZOLLINGER, M D

Cox, L B. On the Relation of Sluder's Neuralgia to the Trigeminal Nerve and to Other Facial Neuralgias. *Med J Australia*, 1932, 1, 202.

This article is the second in which the author attempts to prove that Sluder's neuralgia may be due to an infective neuritis involving fibers derived from the archaic deep ophthalmic nerve which in man is phylogenetically distinct from the remainder of the fifth nerve and is represented by the nasociliary nerve. Two typical cases of Sluder's neuralgia are discussed, one in each article. In the first case the condition was relieved by injection of the gasserian ganglion with alcohol by way of the foramen ovale and in the second by repeated partial section of the sensory root with final section of the ophthalmic fibers.

The article contains a detailed discussion of the anatomy and neurology of the sensory root of the trigeminal nerve and of modern surgical methods of attacking it.

ERIC OLDBERG, M D

### SPINAL CORD AND ITS COVERINGS

Julliard. Chordotomy (La cordotomie). *Re méd de la Suiss Rom*, 1932, lx, 20.

Chordotomy is section of the anterolateral tract of the cord (Gower's bundle) which is bounded in front by the anterior root and behind by the dentate ligament. As this tract carries only sensory fibers, neither motor nor sympathetic fibers are injured. Only the sensory fibers for pain sensation, not those for tactile and deep muscle sensation, are affected. The object of the operation is to prevent pain. The author advises it only for cases of intolerable pain in which the patient's life is in grave danger, such as hopeless cases of cancer. By some it is advocated for chronic painful conditions that do not threaten life such as chronic sciatica, progressive arthritis of the hip and painful amputation stumps. However, as it is dangerous unless it is performed by a very skilled and experienced surgeon Julliard thinks it should be used with great reserve. He reports a case of cancer of the rectum in which it gave excellent results in the control of the pain.

Chordotomy is performed preferably under local anesthesia but may be done under general anesthesia. The dura mater is anesthetized with a novocain tampon. The section of the tract itself is painless. Laminectomy of 3 or 4 vertebrae should be performed to expose the dura for an extent of 6 or 7 cm. The level of the operation depends on the site of the pain to be controlled. For the relief of pain in the pelvis and lower limbs it should be between the fourth and sixth lumbar vertebrae. The dura mater is opened slowly. Section of a posterior root may be necessary, but sometimes it may be possible to pass between the roots. The dentate ligament is used as a guide as it marks the posterior boundary of the tract to be sectioned. The cord is rotated in order to reach the anterolateral tract. This stage of the operation must be performed very carefully or serious injury may result. A small

# SURGERY OF THE NERVOUS SYSTEM

## BRAIN AND ITS COVERINGS CRANIAL NERVES

Burgess and Guibal: Late Intracranial Hemorrhage Following Brain Trauma (Hémorragie intracraniale à symptomatologie retardée consécutive à une traumatisme du crâne) *Bull et mem. Soc. nat. de chir.* 93, livr. 200.

The authors report two cases of late subdural hemorrhage after trauma to the brain which were very much alike. In both, the injury to the brain was followed at first by only slight symptoms, but several weeks later serious signs of brain compression developed. In Burgess's case the interval was forty-three days, and in Guibal's case a month. In both cases trephination was followed by recovery.

Subdural hemorrhage is more frequent than was formerly believed and plays an important part in the complications of brain trauma. In the authors' cases the hemorrhage was probably due to a simple contusion without fracture. In some cases the hemorrhage covers the entire surface of the brain whereas in others it is circumscribed. Sometimes it occurs from the brain parenchyma and sometimes from a ruptured vessel. It may not occur until as long as four months after the injury. However the free interval is rarely entirely free. As a rule there are some brain symptoms. Chief among these are head ache and slight psychic disturbances. Guibal's patient suffered from violent migraine and showed changes of character within a few days after the accident. The development of the signs of brain compression is generally gradual, with successive periods of aggravation corresponding to renewal of the hemorrhages separated by periods of apparent improvement. However in Burgess's case a right hemiplegia developed within two weeks, and in Guibal's case the beginning was sudden, with severe headache, vomiting, agitation, and delirium which in a few hours gave way to torpor and complete coma. The cortical signs are variable and often very difficult to interpret. Of chief importance is recognition of the signs of general hypertension which endangers life and necessitates operation whether the hemorrhage is extradural or subdural. It is sometimes difficult to determine the site of the hemorrhage. In Guibal's case there were localizing signs on both the right and the left sides. Guibal trephined on the right side as this was the side of the trauma. He concluded that the right side was injured directly by the effusion of blood and the left side indirectly by being pushed against the skull.

It was formerly believed that opening of the dura mater would be fatal, but this theory has been proved incorrect. Burgess was able to evacuate the hematoma in his case by simple puncture as the

blood was liquid, but in cases with clotted blood the dura mater must be opened. In the opinion of LECHEMANY, who read the reports of Burgess and Guibal to the Society the dura should not be sutured after evacuation of the clots. Guibal sutured it only incompletely as he feared another effusion. In both Guibal's and Burgess's cases the patient recovered from the coma during the course of the operation. Burgess's patient regained his speech and the use of his limbs at the same time. The patients were back at work seven and eight months respectively after the operation.

All patients with severe injury of the brain and all patients subjected to trephination of the skull may develop late sequelae. In some of the cases of subdural hemorrhage reported in the literature death has resulted, probably because of deep or disseminated lesions of the brain not accessible to surgery.

ANDREW GOSSE MORROW, M.D.

Alexandri, R. Traumatic Jacksonian Epilepsy: Principles of Rational Surgical Treatment. Hemostasis and Replacement of Tissues in Cerebral Surgery (Epilepsia jacksoniana post traumatica curata di cura chirurgica razionale. Emostasi e sostituzione in chirurgia cerebrale) *Ann. ital. di chir.* 93, 24.

Alexandri recommends the following procedures for traumatic jacksonian epilepsy:

Excision of meningeal scars and filling of the defect with fresh fascia lata.

Removal of all bony fragments and repair of the bony defect with strips of bone obtained from the outer table of the skull.

3. Excision of all scarred or cystic areas in the cerebral cortex.

4. Filling of the dead space left by removal of the cortical scar with autogenous muscle grafts.

Three successfully treated cases of traumatic jacksonian epilepsy are reported.

R. OLIVER SEUTELING, M.D.

Salado, M. Endoscopic Examination of the Cerebral Ventricles (Examen endoscópico de los ventrículos cerebrales) *Sem. de med.* 93, xxxvii, 942.

The author has explored the ventricles by endoscopic examination in six cases and has found the procedure harmless. It cannot be used unless the ventricles are more or less enlarged. It requires a very careful technique, and should be performed only by a surgeon with a thorough knowledge of the anatomical details of the cerebral ventricles.

When the occipital pole is to be examined an incision is made two fingerbreadths from the midline and two fingerbreadths above the superior curved line of

the occiput. The bone is then trephined and the ventricle punctured. The size of the ventricle can be judged approximately from the amount of fluid withdrawn. The fluid is preserved as its re-injection may be necessary. On withdrawal of the needle the endoscope is introduced through the same tract. When the endoscope reaches the occipital pole of the ventricle the light is lighted and focused on the walls of the ventricle. The folds of the hippocampus are then readily recognized or the veins of the inner and upper wall of the ventricle are seen. When the latter are followed up the glomus of the choroid plexus is reached. This has a very characteristic appearance. When the choroid plexus is followed and the objective turned upward and inward, Ammon's horn can be seen projecting into the ventricle. The fimbria is partly covered by the choroid plexus.

When the frontal part of the ventricles is to be explored the ventriculoscope is introduced from in front through an incision made over the frontal eminence. To enter the third ventricle a lateral approach is used with the illuminating apparatus perpendicular to the orifice of the foramen of Monro. On the lower and external wall of the frontal pole of the ventricle the head of the caudate nucleus with the putamen can be seen. It is recognized from its pinkish gray color and the large veins that run over it. The upper wall of the ventricle at this point is made up of the corpus callosum.

On completion of the endoscopic examination a roentgenogram is made following the injection of 4 c cm. of lipiodol.

This method is indicated for the exploration and treatment of anatomical lesions of the ventricles and for experimental studies of the nuclei by means of stimulation or extirpation.

ALFRED GOSS MORGAN, M.D.

Alpers, B. J., Yaskin, J. C., and Grant, F. C.  
Primary Fibroblastoma of the Brain. *Arch. Neurol. & Psychiat.*, 1932, LVIII, 270.

The authors report a case of primary fibroblastoma of the brain occurring in a man fifty-two years of age. This is the fourth verified primary fibroblastoma of the brain to be recorded. The symptoms were of two years' duration. An encapsulated tumor 4 cm. in diameter was removed from a depth of 1 cm. in the right motor area. Autopsy performed seventy-two hours after the operation failed to reveal a tumor anywhere except in the brain. The greater part of the tumor had the histological structure of a fibroblastoma, but certain areas presented a peritheliomatous appearance. A large number of the tumor cells were undergoing mitosis.

The authors believe the neoplasm may have been derived from fibroblastic pericytes or the pia membrane surrounding the cerebral blood vessels. They were certain, however, that it had its origin in mesodermal elements, either fibroblasts or cells capable of differentiating into fibroblasts.

ROBERT ZOLLINGER, M.D.

Cox, L. B. On the Relation of Sluder's Neuralgia to the Trigeminal Nerve and to Other Facial Neuralgias. *Med. J. Australia*, 1932, I, 202.

This article is the second in which the author attempts to prove that Sluder's neuralgia may be due to an infective neuritis involving fibers derived from the archaic deep ophthalmic nerve which in man is phylogenetically distinct from the remainder of the fifth nerve and is represented by the nasociliary nerve. Two typical cases of Sluder's neuralgia are discussed, one in each article. In the first case the condition was relieved by injection of the gasserian ganglion with alcohol by way of the foramen ovale, and in the second by repeated partial section of the sensory root with final section of the ophthalmic fibers.

The article contains a detailed discussion of the anatomy and neurology of the sensory root of the trigeminal nerve and of modern surgical methods of attacking it.

ERIC OLDBERG, M.D.

### SPINAL CORD AND ITS COVERINGS

Julliard. Chordotomy (La cordotomie). *Rev. méd. de la Suisse Rom.*, 1932, LI, 20.

Chordotomy is section of the anterolateral tract of the cord (Gower's bundle) which is bounded in front by the anterior root and behind by the dentate ligament. As this tract carries only sensory fibers, neither motor nor sympathetic fibers are injured. Only the sensory fibers for pain sensation, not those for tactile and deep muscle sensation, are affected. The object of the operation is to prevent pain. The author advises it only for cases of intolerable pain in which the patient's life is in grave danger, such as hopeless cases of cancer. By some, it is advocated for chronic painful conditions that do not threaten life, such as chronic sciatica, progressive arthritis of the hip, and painful amputation stumps. However, as it is dangerous unless it is performed by a very skilled and experienced surgeon, Julliard thinks it should be used with great reserve. He reports a case of cancer of the rectum in which it gave excellent results in the control of the pain.

Chordotomy is performed preferably under local anesthesia, but may be done under general anesthesia. The dura mater is anesthetized with a novocain tampon. The section of the tract itself is painless. Laminectomy of 3 or 4 vertebrae should be performed to expose the dura for an extent of 6 or 7 cm. The level of the operation depends on the site of the pain to be controlled. For the relief of pain in the pelvis and lower limbs it should be between the fourth and sixth lumbar vertebrae. The dura mater is opened slowly. Section of a posterior root may be necessary, but sometimes it may be possible to pass between the roots. The dentate ligament is used as a guide as it marks the posterior boundary of the tract to be sectioned. The cord is rotated in order to reach the anterolateral tract. This stage of the operation must be performed very carefully or serious injury may result. A small

cataract dissection is used with a stop to prevent penetrating more than 3 cm. The higher the section the less the depth of the incision. It is very difficult to make the incision exactly the right size. If the incision is too small, the operation is not effective, and if other tracts are touched serious consequences such as motor paralysis, disturbances of micturition and defecation, pain from root lesions, or disturbances of the sympathetic from lesions of the anterior horn may ensue.

The results of anterolateral chordotomy are better than those of peripheral neurectomy, vascular sympathectomy, root section, and section of the posterior bundles of Goll and Burdach. For a few days after the operation there is sometimes girdle pain. Temporary paresis of the lower limbs occurs in about 30 per cent of the cases, probably because of traction on the cord or slight interstitial hemorrhages. It is difficult to determine the mortality of the operation as it becomes confused with that of the disease for which the operation was performed.

Of 144 cases collected by the author the results were good in 103 (73 per cent) and incomplete in 9 per cent. In 4 per cent the operation failed because the technique was faulty and in 3 per cent a recurrence developed. The mortality ranged from 3 to 7 per cent. De Martel has performed chordotomy in 38 cases. The danger of the operation is due to the possibility of late complications such as urinary disturbances and bedsores.

ANDRÉ GOME MORQUEL, M.D.

Migliavacca, A.: The Possibilities for Recovery from Injuries of the Spinal Cord as Determined by Experimental Rachiectomy on the Fetus (*Künstliche Beobachtungen über die Heilungsmöglichkeit der Rückenmarksverletzungen bei der experimentellen Rachiectomie des Fetus*). *Zucker's Jahrbuch f. Gynäk. u. Gynäk.*, 93, 4, 84.

In a study of the processes of regeneration in the nervous system of the lower vertebrates Migliavacca has recently obtained some unexpected results. The less complex organization of the nervous system in these animals permits more exact individualization of the processes of regeneration. Microscopic slides demonstrate that after they have been divided the fibers in the spinal cord may reunite and some of the functions controlled by them may be resumed.

In the author's opinion the failure of other investigators to obtain results has been due to their attempt to study regeneration during a period in the life of the animal when the production of new fibers in the spinal nervous system had already become sluggish. Failure may be explained also by the fact that the necessary operative procedures are very delicate and the mortality is exceedingly high.

The author's technique on rats and mice is as follows:

The gravid uterus is drawn out through a incision in the abdominal wall and one of the fetuses is exposed. The back of the fetus is fixed against the

uterine walls and the continuity of the vertebral column is interrupted by a single sweep of a Graefe knife. The knife is directed straight down alongside the vertebral column in the upper lumbar region and then with a lateral motion the vertebral column is cut through. The separation of the cord must be complete, and may be tested by the amount of displacement of the cut surfaces. The uterus is then closed with very fine silk sutures.

Photomicrographs demonstrate the abrupt termination of the peripheral end of the cut fiber and the fibrils which spring from it and spread fanwise toward the bundle of newly formed fibrils coming from the tract above. ODFORTAL (G)

## PERIPHERAL NERVES

Speed, K.: Common Peripheral Nerve Lesions. *Surg. Clin. North Am.*, 93, 24, 45.

The author reports four cases of traumatic injury of peripheral nerves.

The first was a case of ulnar neuritis following a fracture of the olecranon, which was cured by neurolysis.

The second was a case of compression neuritis of the radial nerve following long-standing osteomyelitis of the humerus on which operation had been performed. This was cured by bone removal, mechanical cleansing, and neurolysis.

The third case was one of complete loss of a considerable extent of the radial nerve following an infected gunshot fracture of the humerus. Restoration of the nerve was impossible, but functional improvement was obtained by tendoplasty at the wrist in which flexor power was transmitted into the extensor tendons to raise the wrist and hand and extend the thumb.

In the fourth case there was severance of the radial nerve from a knife stab which was overlooked at the time of the injury. End-to-end suture of the nerve was done after excision of the scar.

In discussing the treatment of complete severance of a nerve the author emphasizes the importance of free mobilization of the nerve ends. He states that when the nerve has contracted length may be gained by stripping proximal motor branches, displacing the nerve into a new bed at a different angle, or performing a two-stage operation to draw the nerve ends together with the aid of their own clastices. Bone shortening and tendoplastic operations should be reserved for cases in which end-to-end suture of the nerve is impossible. The author discusses also the influence of various factors on the prognosis of peripheral nerve lesions.

Pollock, L. J., and Davis, L.: Peripheral Nerve Injuries. Second installment. *Am. J. Surg.*, 193, 24, 340.

In the second installment of this treatise on peripheral nerve injuries the authors continue the detailed description of examination methods and the evaluation of the findings in such injuries. They

discuss chiefly the sensory disturbances. Subjective sensory disturbances, paræsthesias, pain, and hyperæsthesias were noted in what seemed to them a surprisingly small number of cases. They believe that, excluding causalgia, pain does not often result from injury of a nerve itself after the initial trauma. Of about 500 patients examined soon after injury, fewer than 10 per cent had recorded subjective sensory disturbances. Those with injuries to the sciatic nerve had the greatest number of such disturbances. Pain was unusual. Hyperæsthesia was most common. Anæsthesia was seldom mentioned. However, causalgia and other sensations sometimes developed after the return of some function. When complete physiological interruption still existed, subjective disturbances were rare. Subjective disturbances were found in a greater percentage of sciatic and median nerve injuries than injuries of other nerves. In combined lesions the area supplied by the tibial or median nerves was more frequently the site of such disturbances.

Causalgia is discussed in detail. While the pathogenesis as well as the pathology of this condition is unknown, the authors present the theories put forth in the literature. In the cases reviewed the association of glossy skin with the burning pain was not constant. The authors believe it is very likely that all patients who complained of mild or severe burning pain with or without glossy skin were suffering from a certain grade of causalgia. This condition occurred most frequently in injuries of the median and sciatic nerves, occasionally in injuries of the ulnar nerve and then usually when there was an associated injury of the median nerve, and very rarely in injuries of the radial nerve.

Methods of examining for objective sensory disturbances are outlined in detail. Simple methods of examination are considered best. Methods employed in physiological research and such procedures as the use of Frey's hairs are not necessary. Simple but accurate apparatus made up from articles at hand in every physician's office are described. For the accurate estimation of the extent of objective sensory disturbances the examination must be done very carefully. Care must be taken to avoid fatiguing the patient by a too protracted examination at one time. In the evaluation of the findings, local changes in the skin, œdemas, and calluses should be considered. It is important also to distinguish between sensation which is normal and sensation arising in areas of nerve overlap.

The return of sensibility to prick pain occurring before the return of sensibility to touch is due to the assumption of function by adjacent nerves. The authors believe that many assumed early recoveries following nerve suture are explained by misinterpretation of this early return of prick pain. The areas of overlap and the areas of so-called isolated supply of the various peripheral nerves most prone to injury have been carefully worked out by the authors and are shown by illustrations.

HALE HAVEN, M D

Pollock, L J, and Davis, L. Peripheral Nerve Injuries. Third Installment. *Am J Surg*, 1932, 571.

In this third installment of their treatise on peripheral nerve injuries the authors continue their discussion of methods of examination by describing the vasomotor, trophic, and secretory disturbances following peripheral nerve injuries. While some of these disturbances are due directly to a lack of nerve supply, many are thought by the authors to be caused by other factors such as injury to vessels or continued immobilization. Disturbances of circulation, disturbances in the skin and its appendages, the hair and nails, and disturbances of the secretion of sweat are considered in detail. Changes in the subcutaneous tissues such as œdemas, inelastic indurations, and appearances similar to Volkmann's contracture are attributed to vascular or lymphatic disturbances.

The methods of electrical examination are described in detail with charts of the motor points for such examination. The authors believe that reflex changes in general are not so significant in relation to diagnosis and prognosis in peripheral nerve lesions as in disease or injury of the central nervous system. They consider the most important deep reflexes to be the Achilles jerk, the knee jerk, the wrist jerk or stylo-radial reflex, the ulnar pronator reflex, and the triceps jerk.

A chapter is devoted to the differential diagnosis of peripheral nerve lesions. The main points of differentiation between such lesions and lesions of the central nervous system that are likely to be confused with them are given. The functional disturbances simulating peripheral nerve injuries and the differences between them and organic lesions are discussed in detail.

The signs of the severity of a peripheral nerve lesion are rather obscure. The authors believe there is no way by which a complete loss of function due to anatomical interruption can be differentiated from complete loss of function due to physiological interruption produced by compression, and that in a case of complete physiological interruption an anatomical section can be ruled out only when a subsequent examination shows some return of function.

The signs of recovery of function or signs of regeneration of a nerve are discussed in detail. The common tests for recovery are reviewed and the relative merits of each are considered. In the authors' experience, the order of the return of function in severe lesions has been sensation to pinching over the isolated supply of a nerve, at times spontaneous aching in muscles, return of motion, return of other objective sensibility, and return of electrical excitability.

In the final chapter of this installment the authors give a brief review of the present-day concept of the development and structure of the peripheral nervous system. The theory of funicular topography and its value in the surgical treatment of nerve injuries,



cular of histology is used with a stop to prevent penetrating more than 3 cm. The higher the section the less the depth of the incision. It is very difficult to make the incision exactly the right size. If the incision is too small, the operation is not effective.

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AUDLEY GORE MORGAN M.D.

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**Feilcke, L. J., and Davis, L.** Peripheral Nerve Injuries. Second Installment. *Am. J. Surg.* 93, 27, 349.

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# SURGERY OF THE CHEST

## CHEST WALL AND BREAST

Fray, W W, and Warren, S L Stereoscopic Roentgenography of the Breasts *Ann Surg*, 1932, xc, 425

Stereoscopic roentgenography is recommended as an additional aid in the examination of the breast and not as a substitute for any other procedure. It is of advantage over transillumination as it permits the determination of encapsulation of a tumor; it differentiates mastitis from malignancy; it gives data concerning involvement of the pectoral muscles, ribs and axillæ; it reveals calcification, and it furnishes a permanent record for further comparison.

Acute changes in the breast cast shadows which are soft, feathery, indistinct, and diffuse, whereas chronic conditions produce shadows which are dense, sharp, distinct, and more compact because of the connective tissue changes. Cysts are identified from fat lobules by greater density and sharp outlines.

With regard to the roentgen picture of mastitis and carcinoma the authors state that carcinoma originates in a single area within one breast whereas mastitis usually has multiple points of origin and often involves both breasts. Carcinoma forms a compact mass with an indefinite periphery, while mastitis produces a diffuse mass fading imperceptibly to the normal structures peripherally. The scarring of malignancy distorts the breast pattern, whereas the scarring of chronic mastitis does not. Mastitis never destroys the thin septum between the breast and the pectoral muscles, but malignancy frequently invades this region. Late carcinoma of the breast is identified from the presence of large nodes and other metastases.

With the aid of stereoscopic roentgenography the authors have made a correct diagnosis in from 85 to 90 per cent of cases coming to operation. Of the patients whose condition was diagnosed as mastitis, none has developed a malignant tumor during an observation period of approximately four years.

At times stereoscopic roentgenography yields clues as to the type of breast malignancy.

EARL O LATIMER, M D

Adair, F E The Results of Treatment of Mammary Carcinoma by Surgical and Irradiation Methods at the Memorial Hospital, New York City, During the Decade from 1916 to 1926 *Ann Surg*, 1932, xc, 410

By the term "operable mammary cancer" the author means a cancer which is limited to the breast or to the breast and the axilla. Any extension of the disease beyond the axilla into the supraclavicular fossa, the liver, the chest, or other distant parts is considered to render the tumor inoperable.

The surgical treatment of mammary carcinoma aims at absolute eradication of the disease process by wide radical extirpation of the breast, its contiguous tissues and its drainage basins. As a rule the surgeon has only one opportunity to effect a cure.

The irradiation method aims at devitalizing the tumor tissue and at the same time changing the character of the surrounding tissue or cancer bed into a firm fibrotic and occasionally calcified mass, thereby gradually strangling and starving the cancer cells and rendering them unable to undergo division and metastasis. The irradiation technique includes the use of high-voltage X-rays, interstitial irradiation, and radium packs.

Of 37 patients treated by irradiation methods only, 4 died of intercurrent disease, 21 died of cancer, and 12 are living five years after the treatment.

Of 137 patients treated by irradiation and surgery, 9 died of intercurrent disease, 85 died of cancer, and 52 are living five years after the treatment.

The author concludes that when surgery is contraindicated, the most effective treatment is combined interstitial and external irradiation.

EARL O LATIMER, M D

## TRACHEA, LUNGS, AND PLEURA

Pancoast, H K, Pendergrass, E P, and Tucker, G Localization of Foreign Bodies in the Lung by Roentgen Examination, With Comments on Bronchoscopy Under Biplane Roentgenoscopic Guidance *Am J Roentgenol*, 1932, xvii, 225

The localization of certain opaque foreign bodies in the tracheobronchial tree is attended with great difficulty when the diseased area of lung is of a density almost as great as that of the foreign body. The authors report two illustrative cases and describe the methods used in the localization of the foreign bodies and their bronchoscopic removal with biplane roentgenoscopic aid. The foreign bodies could be seen clearly in roentgenograms made with the use of the Buck diaphragm, but could not be seen on the roentgenoscopic screen. In order to guide the bronchoscopist with the biplane roentgenoscope, opaque markers were placed upon the skin in fixed relationship to the foreign bodies.

Tucker says that this method permits the safe removal of foreign bodies that cannot be localized by ordinary procedures. However, as it is much more difficult and dangerous than bronchoscopy under direct vision, it should be used only when bronchoscopy by direct vision cannot accomplish the desired result. It should not be employed to make up for inadequate training of the bronchoscopist. As safe localization requires guidance in two

especially with relation to specific nerves, is discussed in detail.

HALE HAVEN, M.D.

### SYMPATHETIC NERVES

Davis, L., and Pollock, L. J.: The Role of the Sympathetic Nervous System in the Production of Pain in the Head. *Arch. Neural & Psychol.*, 93: xvii, 582.

To determine the rôle of the sympathetic fibers in the production of pain in the face, the authors carried out experiments on cats. Stimulation of the cervical sympathetic trunk with a faradic current did not produce pain, but caused dilatation of the pupil on the same side and a movement of the nictitating membrane. Negative evidence of the production of pain was obtained also when the central or distal ends of the divided sympathetic trunk were stimulated. Pain was produced by stimulation of the superior cervical sympathetic ganglion regardless of whether the trunk was intact or severed below the ganglion. It caused pain also after section of either the anterior or the posterior spinal roots. It failed to cause pain only after intracranial section of the trigeminal nerve and section of the posterior roots.

The authors conclude that the appreciation of the pain caused by stimulation of the superior cervical sympathetic ganglion was effected by the stimulation of efferent sympathetic fibers which in turn stimulated recognized sensory pathways in the cranial nerves. They believe their findings constitute further evidence that there are no autonomic sensory fibers in the cervical spinal anterior roots.

ROBERT ZOLNOR, M.D.

André-Thomas and Kudelski: The Syndrome of the Lumbar Sympathetic Chain. *Sémiologie (Syndrome de la chaîne sympathétique lombaire Sémiologie)* *Presse méd.* Par 1933 xl, 57.

The authors report a case of widespread senile cross tumor located mainly on the right side of the pelvis and abdomen. While the neoplasm involved the lower cord and the cauda equina as the result of its growth into the vertebral canal, the most interesting findings were those relating to the sympathetic nervous system. The tumor mass verified at autopsy had apparently completely destroyed the function of the lumbar and sacral sympathetic chains on the right side by its metastasis with invasion of the ganglia and nerves of the lumbar sympathetics. The invasion did not extend to the sacral ganglia, but the lumbar invasion probably destroyed the efferent fibers to the sacral plexus.

Clinical examination had revealed total absence of the pilomotor reflex and of sweating on the right side in the region supplied by the lumbar and sacral plexuses. The increased skin temperature on the right side was more noticeable in the distal segments where it was 3 or 4 degrees higher than on the left side. The marked edema of the entire right lower extremity was accounted for not only by the destruction of the sympathetics on that side, but also by embarrassment of the venous return from the extremity. Roger and Josué have demonstrated that both of these factors are necessary for the production of such an edema.

In the authors' opinion their observations demonstrate again the rôle of the sympathetic system in temperature regulation, vasomotor reaction, pilomotor phenomenon and sweating.

HALE HAVEN, M.D.

appears more transparent than the layer of gas surrounding it. He reports nine cases in which this observation was made. In all, a serofibrinous pleurisy was present. The author attributes the paradoxical transparency of the collapsed lung to adhesions between the visceral and parietal pleura and the deposition of fibrin on the free areas of the chest wall.

C. D. HAAGENSEN, M.D.

**Boneo, F. E.** A Contribution to the Surgical Treatment of Pleuropulmonary Tuberculosis, Phrenicectomy (Contribución al tratamiento quirúrgico de la tuberculosis pleuropulmonar, frenicectomías) *Semana Méd.*, 1932, xxx, 337

After reviewing the important anatomical landmarks of the phrenic nerve the author describes the technique of phrenicectomy performed to produce collapse and compression of the tuberculous lung. As a result of simple section of the nerve on the involved side, the lung is reduced in size and put at rest, the blood and lymphatic drainage from the disease focus and the absorption of toxic products are diminished and sclerosis and fibrosis of the lung are favored. However, as the compression is not equal to that obtained by pneumothorax or thoracoplasty, phrenicectomy is of value chiefly as an adjunct to one of the latter procedures. The author believes that the benefit derived from phrenic nerve division alone is often negligible.

In 107 cases in which phrenicectomy has been done since 1928, there have been no deaths directly attributable to the operation.

In conclusion the author says that phrenicectomy is as much an adjunct to the surgical treatment of pulmonary tuberculosis as any of the procedures constituting the basic hygienic treatment of the disease. The most important factors in the treatment of the condition are diet and measures to improve the general condition.

Phrenicectomy is indicated as a diagnostic procedure for simple elevation of the diaphragm, as a supplement to pneumothorax, and as a preliminary to thoracoplasty.

FRANCIS M. CONWAY, M.D.

**Sergeant, E.** Abscessed Bronchiectasis, Abscesses Producing Bronchiectasis, and Bronchiectatic Abscesses (Bronchiectasies abscedées, abcès bronchiectasiques et abcès bronchiectasiques) *Presse Méd.*, Par., 1932, xl, 273

The classification of bronchiectases and abscesses or gangrenous foci in the lungs has been very confused. The author suggests a classification into three broad types. In the first type he describes the abscess or gangrenous focus in the lung develops as a complication in the course of bronchiectasis. This is the type he calls "abscessed bronchiectasis." In the second type, which he calls "abscess producing bronchiectasis" the gangrene or abscess is the primary condition and is complicated by bronchiectasis after a varying period of time. In the third type the picture is very complex and the bronchiectasis and abscess seem to develop simulta-

neously. This is a veritable suppurating bronchopneumonia which is generally very severe, but may become chronic. It is the only type corresponding to what the Americans call "bronchiectatic abscess." Typical cases of these three types are reported with roentgenograms.

For the treatment of some of these types of combined bronchiectasis and abscess the author recommends bronchoscopy, which he has been using for the past four years. This procedure is not dangerous except in the cases of cachectic patients and those with heart lesions, in whom it may cause syncope. Its object is to evacuate the suppurated foci which drain poorly. It can bring about cure only in recent cases in which the suppuration is not walled in by sclerosis. In chronic abscesses and old bronchiectasis it has only a temporary and palliative action. In cases of cortical abscess near the chest wall surgical operation is indicated. For deep abscesses, particularly those near the hilus, aspiration bronchoscopy is to be preferred. When surgical operation is indicated it should be preceded by aspiration bronchoscopy to drain the pus which has accumulated in the bronchi and to prevent reflux of the pus into the other lung after rib resection. Pre-operative bronchoscopy is indicated particularly in cases of gangrenous foci or putrid abscesses with jagged and necrotic walls. It cleanses these foci, transforms them into cavities with smooth walls, and suppresses the fetid odor by removing the necrotic debris.

AUDREY GOSS MORGAN, M.D.

**Wessler, H., and Rabin, C. B.** Benign Tumors of the Bronchus. *Am. J. M. Sc.*, 1932, clxxxii, 164

The clinical picture produced by a benign tumor of the bronchus is described on the basis of seventeen cases. As a rule there is a long period without symptoms of bronchial obstruction or irritation but with repeated hemorrhages. The bleeding is characteristically sudden in onset and cessation. When stenosis of a bronchus with infection occurs, the clinical picture is confusing. Care must be taken in the microscopic diagnosis of a benign bronchial tumor lest it be regarded as malignant. The early discovery and removal of the tumor through the bronchoscope may lead to prompt cure. The tumor was removed successfully in six of the cases cited. Two cases which are reported in detail indicate that polypoid adenoma may undergo malignant degeneration.

EDWARD D. CHURCHILL, M.D.

**Ruetz, A.** Advances in Thoracic Surgery. The Lungs and Costal Pleura (Fortschritte der Thoraxchirurgie Lungen, Rippenfell) *Zentralbl. f. Chir.*, 1931, p. 2704

The author reviews almost exclusively the contributions of the Sauerbruch Clinic to the development of surgery of the lungs and pleura and discusses the present position of the Clinic with regard to the important questions in this field of surgery.

Of the methods available for collapse of a diseased lung, artificial pneumothorax is recognized as the

planes at a right angle, roentgenoscopic bronchoscopy should not be attempted unless biplane guidance is possible. There must be perfect co-operation between the roentgenologist and bronchoscopist. Greater skill is required of the bronchoscopist during roentgenological guidance than when he is working by sight.

ANDREW HARTWIG, M.D.

Coryllos, P. N., and Birnbaum, G. L.: Studies in Pulmonary Gas Absorption in Bronchial Obstruction. I. Two New Methods for Direct and Indirect Observation. *Am J M Sc.*, 93: clxxvii, 37

The authors describe a "closed-chest" and an "open-chest" technique, in both of which complete bronchial obstruction is obtained by a special type of cannula through which gas samples can be drawn for analysis from beyond the obstructed portion of lung. In the closed-chest method the changes in the lung are followed by roentgen examination. In the open-chest method the lung is exposed to view within a glass-covered oscillating negative-pressure box which closely simulates the physiological conditions of the closed thorax.

The obstructing mechanism consists of a rubber balloon with a one-way valve. The balloon is introduced with the bronchoscope and inflated from the outside. It may then be detached from its connection and left in place. Inflation is done under the guidance of a mercury manometer. The inflation must be accurate because if the pressure is insufficient the bronchus will not be completely occluded, and if the pressure is excessive it will interfere with the circulation, the innervation of the bronchus, or the ventilation of neighboring bronchi.

J. DANIEL WILLIAMS, M.D.

Coryllos, P. N., and Birnbaum, G. L.: Studies in Pulmonary Gas Absorption in Bronchial Obstruction. II. The Behavior and Absorption Times of Oxygen, Carbon Dioxide, Nitrogen, Hydrogen, Helium, Ethylene, Nitrous Oxide, Ethyl Chloride, and Ether in the Lung, with Some Observations on Pleural Absorption of Gases. *Am J M Sc.*, 93: clxxviii, 38.

The authors have devised experimental methods which give evidence that when a bronchus is completely obstructed the entrapped alveolar air rapidly undergoes qualitative and quantitative changes.

Qualitatively the percentages and partial pressures of the gases constituting the alveolar air tend to but never quite do, reach an equilibrium with the gases in the venous blood.

Quantitatively the entrapped alveolar gases pass through the respiratory membrane into the blood circulating in the perialveolar capillaries until complete anoxemia of the involved area results.

The mechanism of production of atelectasis in the compressed lung (pneumothorax, pleural exudate, intrathoracic tumors, etc.) is exactly the same as in bronchial obstruction.

Atelectasis is the end result of the interchange between the gases of the alveoli and the perialveolar

capillary blood through the pulmonary endothelium. It must inevitably follow complete bronchial obstruction as the result of the absorption of the alveolar gases. Conversely it cannot occur unless the alveolar gases are completely shut off from the external air.

J. DANIEL WILLIAMS, M.D.

Coryllos, P. N., and Birnbaum, G. L.: Studies in Pulmonary Gas Absorption in Bronchial Obstruction. III. A Theory of Air Absorption in Atelectasis. *Am J M Sc.* 93: clxxix, 37.

Gases and anesthetic vapors contained in alveolar cavities shut off by complete bronchial obstruction gradually leave the lung and disappear so that the lung becomes atelectatic.

The speed of the disappearance of these gases is proportional to their solubility coefficients, their diffusion speeds, and their chemical affinities for substances in the blood (hemoglobin in the case of oxygen, alkalies in the case of carbon dioxide).

Since ligation of the branches of the pulmonary artery corresponding to the obstructed lung prevents the disappearance of gases and vapors from the alveoli, it has been claimed that the disappearance is due to absorption by the blood circulating through the lung. However this contention has never previously been proved by direct experimental evidence.

The authors report a detailed study of the rates of absorption of oxygen, carbon dioxide, nitrogen, hydrogen, and helium introduced into a lung previously rendered atelectatic. The absorption times were determined with considerable accuracy and the absorption of the gases was proved.

Determinations which were carried out by the same technique on anesthetic vapors and gases such as ether, ethyl chloride, nitrous oxide and ethylene showed great rapidity of absorption.

Integrity of the alveolar endothelium is just as necessary as integrity of the pulmonary circulation. Edema of the lung produced by the injection of concentrated ether vapor into the lung instantly stops gas absorption.

A comparative study of absorption by the pleural cavity of oxygen, carbon dioxide, nitrogen, air, hydrogen, and helium showed that the absorption is regulated by the physicochemical laws governing the absorption of gases from the obstructed lung.

On the basis of the findings of these experiments the authors conclude that atelectasis always follows complete bronchial obstruction and cannot occur without complete bronchial obstruction.

J. DANIEL WILLIAMS, M.D.

Accoromboni, M.: The Particular Roentgenological Appearance of Pneumothorax Complicated by Adhesive Pleurisy. The Paradoxical Image of the Lung (Aspetto radiologico particolare del pneumotorace complicato da pleurite adesiva [immagine paradossica del polmone]). *Radiol. med.* 93: xix, 38.

After the induction of artificial pneumothorax the author has occasionally noted that the collapsed lung

# SURGERY OF THE ABDOMEN

## ABDOMINAL WALL AND PERITONEUM

LaRoque, G P The Intra-Abdominal Method of Removing Inguinal and Femoral Hernia *Arch Surg*, 1932, xiv, 189

The author's intra-abdominal method of removing inguinal and femoral hernia has been used in 1,700 cases

LaRoque objects to the usual herniorrhaphy because of the associated injury to the cremaster muscle and fascia, the enlargement of the inguinal canal caused in determining the planes of cleavage, and the difficulty in dissecting out the sac of long-standing hernia of large size

In LaRoque's method, in which the hernia is approached from the peritoneal side, it is easy to recognize and distinguish between hernia into the inguinal and femoral canals, direct and indirect inguinal hernia, and unusual and anomalous types of hernia, and to determine the amount of redundant peritoneum and preperitoneal fat in and about the canal, the exact location of the bladder, vas deferens and important vessels, and the nature of any complications that may be present LaRoque's technique is shown in illustrations

JACOB M. MORA, M.D.

## GASTRO-INTESTINAL TRACT

Shelley, H J Perforated Peptic Ulcer *Am J Surg*, 1932, xv, 277

The author reviews eighty-two cases of perforated peptic ulcer In those which were operated upon within twelve hours after the perforation the mortality was below 9 per cent, whereas in those in which operation was performed later, it was between 25 and 50 per cent. When the perforation opened into the free peritoneal cavity the mortality was 19.6 per cent, but when the perforation was sealed off, the mortality dropped to 12 per cent. The total mortality was 18.3 per cent. The mortality was highest in cases which required the most surgery, such as those in which the perforation occurred retroperitoneally or into the pancreas. The most frequent complications were pulmonary conditions, which developed in about 43.3 per cent of the cases. Peritonitis was not considered a complication as in all of the cases the peritoneum was contaminated at the time of the operation.

Sixty-seven per cent of the patients were rendered free from symptoms. Twelve patients who were re-operated upon subsequently were rendered free from symptoms by the second operation.

The author concludes that at the time of the first operation no more than is absolutely necessary should be done. Additional operative procedures

should be left for a subsequent time and then carried out when indicated. SAMUEL J. FOGELSON, M.D.

Lockwood, B C Benign Tumors of the Stomach. *J Am Med Ass*, 1932, xcvi, 969

About 5 per cent of all gastric tumors are benign. Benign gastric tumors include fibromata, fibromyomata, myomata, adenomata, lipomata, myxomata, and cysts. They vary in size, number, and mobility. They may occur in any region of the stomach, but are found most often in the middle third. They may be entirely intramural, project into the lumen of the stomach in sessile or pedunculated form, or project outside of the stomach on a pedicle. The symptoms are determined by their size, nature, and position. Small growths which are not ulcerated and not near the pylorus may be symptomless. Large intramural or pedunculated tumors usually disturb gastric function by pressure or traction, causing symptoms of indigestion such as distress or pain after meals, heartburn and nausea. Sessile or pedunculated tumors situated near the pylorus may produce intermittent ball-valve obstruction of the pylorus with attacks of severe pain, nausea, and vomiting, and often bleeding. Intermittent bleeding occurs often also in cases of polyps situated at a distance from the pylorus, probably because of the excessive vascularity of these neoplasms.

The laboratory observations are not characteristic, but achlorhydria and secondary anemia are common.

The most valuable method of diagnosis is roentgen examination with a contrast meal and with the patient in the prone and the upright positions. Of great importance is fluoroscopic examination with a few swallows of barium and careful manual approximation of the gastric walls. The characteristic sign of a mural, sessile, or internal pedunculated growth is a sharply contoured filling defect with pliancy of the gastric walls. Except in cases of multiple polyps, the rugae have a normal appearance. In gastric polyposis the roentgen picture shows numerous small rounded translucences suggesting a sponge or finger marks.

Because of the not uncommon occurrence of malignant degeneration, the treatment of benign gastric tumors is surgical.

The author reports three cases of benign tumor of the stomach. In the first there was a sessile neuroblastoma protruding into the cavity of the stomach from the posterior wall, in the second, a large vascular myoma along the outside of the lesser curvature with a gastric ulcer at the site of its attachment, and in the third, a papillomatous polyp arising from the edge of a marginal ulcer.

MAURICE MEYERS, M.D.

procedure of choice in pulmonary tuberculosis. It is not suitable for exudative tuberculosis, in which the prerequisites for cure—proliferation of connective tissue and contraction—are absent from the beginning, but in early infracavicular infiltration it may bring the exudative process to a standstill if it is induced at the proper time. Thoracoscopic section of bands with the thermocautery is used at the Sauerbruch Clinic only for very delicate strands. Phrenic excisions alone is of value only in circumscribed tuberculous disease of a lower lobe. Thoracoplasty is done as a rule under paravertebral conduction anesthesia, ether anesthesia being employed only when the amount of sputum is small. In extensive processes, all of the ribs, from the first to the eleventh, must be resected. Only exceptionally, when the disease involves chiefly the upper part of the lung, is resection of the first to the eighth rib sufficient. With regard to the selective thoracoplastic collapse recommended by Graf for cases of isolated disease in an upper field it is believed at the Sauerbruch Clinic that such extensive operations are by no means always necessary.

Chief among the indications for tamponing procedures is collapse of the smooth-walled cavity lined with epithelium (the so-called non-specific cavity). Tamponade can never replace thoracoplasty; it may be considered only for circumscribed compressions. Attention is called to the "infolding tamponade" recommended independently by Nielsen and Haucke. Occasionally tamponade is followed by symptoms of intoxication as the result of inundation of the organism by toxins. The extrapleural tamponade recommended by Sauerbruch for elimination of the free pleural space has considerably advanced the surgical treatment of non-specific suppurations of the lung. In bronchiectasis in children extrapleural tamponade is the procedure of choice. In the cases of young adults and middle-aged patients lobectomy is the best procedure if less radical treatment proves unsuccessful.

The indications for and technique of operative procedures in cases of tumors, foreign bodies in the lungs, emphysema and asthma are discussed. In spontaneous pneumothorax, surgical treatment is rarely indicated, but in tension pneumothorax immediate surgical interference is necessary. In the treatment of pleural empyema the most important advance was the discovery that one of the main causes of the previous high mortality of this disease was wide open drainage before immobilization of the

mediastinum. Empyema on the right side endangers the circulation more than empyema on the left side. The most ideal treatment of empyema is puncture. Often a single puncture leads to cure. The author reviews the indications for and the technique of, radical procedures for the various forms of empyema as reported by the Sauerbruch Clinic. Graf (2).

#### HEART AND PERICARDIUM

Shiley, A. M.: The Operative Approach to the Heart and Pericardium. *Surg. Gynec. & Obst.* 1933, 57, 530.

For the surgical exposure of the heart and pericardium when either or both of these structures are injured by a wound, the author recommends the Spangaro intercostal incision. This is typically made in the fourth interspace from the anterior axillary line to the margin of the sternum. It is closed by pericostal sutures.

For the drainage of suppurative pericarditis a combination of the transternal and chondrosternal approach is recommended. The sternum is trephined just above the xiphoid, a little to the left of the center and the opening is enlarged with the rongeur until the ends of the fifth and sixth left cartilages are cut away. After exposure, the pericardium is picked up with forceps and incised.

EDWARD D. CRAWFORD, M.D.

#### ESOPHAGUS AND MEDIASTINUM

Duggle, F. H.: Foreign Bodies in the Esophagus. *Brit. M. J.* 1933, 1, 977.

Of sixty-seven cases of foreign body in the respiratory or digestive tract seen in the last ten years, the foreign body was found in the lower airways in two and was impacted in the esophagus in sixty-five.

The author attributes the increased frequency of foreign bodies in the respiratory passages in America to the American habit of eating peanuts.

Anatomically the esophagus is constricted at four levels: (1) at the suprasternal notch (2) at its orifice on a level with the sixth cervical vertebra (3) at the level of the fourth or fifth thoracic vertebra, where it is constricted by the arch of the aorta and the left bronchus and (4) at the level of the ninth or tenth thoracic vertebra, where it passes through the diaphragm. In the cases reviewed the foreign bodies were found at one of these levels.

WILSON BAILEY, M.D.

As the normal physiological processes of the duodenum are related to the normal physiological processes of the pancreas and liver, all of the upper part of the abdomen on the right side may be involved in the production of symptoms referred to the duodenum. In duodenal stasis the symptoms are due not only to pathological changes in the duodenum resembling those of high intestinal obstruction but also to associated liver damage. Accordingly there may be the syndrome due to distention of the duodenum with subsequent regurgitation into the stomach leading to the vomiting of bile and epigastric cramps, and the stagnant duodenal contents may empty into the jejunum and cause intestinal colic and diarrhoea. Absorption of the highly toxic duodenal contents may produce the clinical manifestations of high intestinal obstruction, such as cardiovascular shock, a decrease in the blood chlorides, an increase in the non-protein nitrogen content of the blood, nervous intoxication with headache, tetany and convulsions, emaciation, a subnormal temperature, biliousness, and the appearance of occult and microscopic blood in the urine and faeces. When a true duodenal ulcer or gastropyloroduodenitis (red stomach) is present the syndrome may be that of duodenal ulcer or there may be subhepatic pain radiating posteriorly to the right with tenderness on deep pressure and on percussion at the base of the right side of the chest.

The course of duodenal stasis varies, but in general is chronic and characterized by periods of amelioration and recurrence. As the bacteria increase rapidly in the duodenal contents, the adjacent organs may become infected and hepatitis or pancreatitis may result.

The roentgen diagnosis of duodenal stasis is often very difficult as during the examination the patient may be in a period of compensation and stasis may be absent. Normally the duodenum empties in from eight to fifteen seconds and the bulb in from four to eight seconds. The patient should be examined first after he has taken only one or two swallows of barium. As stasis increases as the gastric and duodenal musculature becomes fatigued, it can be readily diagnosed when the stomach is almost empty. The barium may remain in the third and fourth parts of the duodenum for from eight to ten hours. The duodenal deformity is usually a dilatation which varies not only with the degree and duration of the stasis but also with the phase of the condition (active or latent). Marked reverse peristalsis may be present.

The treatment indicated varies with the cause. When the stasis is secondary to a pathological condition extrinsic to the duodenum surgical correction of the latter is sufficient. In essential duodenitis a choice may be made between radical resection—antropyloroduodenectomy—and conservative measures such as gastroenterostomy plus duodenojejunostomy. The authors prefer the latter. Duodenal stasis of nervous origin may be treated by resection or gastric denervation. Gastric denerva-

tion performed by the authors in five cases resulted in complete relief of the symptoms in two, partial relief in one, and no relief in two.

SAMUEL J FOGELSON, M D

## LIVER, GALL BLADDER, PANCREAS, AND SPLEEN

Chabrol, E., Charonnat, R., and Busson, A. The Amount of Biliary Pigment in the Blood The Restricted Diazo Reaction (Le dosage des pigments biliaires du sang La diazo réaction limitée) *Presse méd.*, Par., 1932, xl, 193

There are four methods by which the biliary function of the liver may be investigated by means of blood tests colorimetry oxidizing reactions, diazo reactions and the use of the spectroscope.

In colorimetry, solutions of potassium bichromate or chromic acid have been used for the yellow color. When ovalated serum is employed vegetable pigments in the blood, especially carotin cause difficulty. These can be eliminated without precipitating albumin by adding 0.5 c.cm. each of phosphoric acid and hydrogen peroxide.

In the oxidizing test of Gilbert and Herscher nitric acid is used, but this test requires a wait of half an hour and a personal evaluation of the blue ring and is not delicate enough to detect less than 2 ctgm of bilirubin per liter. Fouchet's method in which trichloroacetic acid and perchloride of iron are employed permits the detection of bilirubin in a dilution of 1:1000.

Ehrlich's diazo reaction produces red in a neutral solution and violet blue in an acid medium when bilirubin is present. It is sufficiently sensitive to show 1 mgm of bilirubin to the liter in an aqueous solution provided the bilirubin has not been subjected to oxidation. From Ehrlich's reaction the van den Bergh reaction and the authors' restricted diazo reaction were developed.

The authors discuss the delicacy of the van den Bergh reaction. The successive additions of alcohol necessary in the indirect method are said to weaken the sensitiveness of the test.

The authors' restricted diazo reaction aims to avoid the errors induced by alcohol extraction. The authors use the blood serum, diluting with a 15 per cent solution of pure magnesium sulphate to give a different density from that of the diazo reagent. The color of the icteric serum is brought to the pale yellow of normal serum by dilution. With a 20-c.cm graduated pipette, hemolyzing tubes are partly filled with varying proportions of the diluted serum and the 15 per cent magnesium sulphate solution no more than 1 c cm being introduced into any tube. The diluted blood serum is added to the tubes thus  $\frac{10}{10}$ ,  $\frac{18}{10}$ ,  $\frac{10}{10}$  and  $\frac{2}{10}$ . The complement of magnesium sulphate in the corresponding tubes amounts to  $\frac{1}{10}$ ,  $\frac{10}{10}$ , and  $\frac{18}{10}$ . The tubes are then shaken and set up in an inclined position and the diazo reagent is slowly poured in with a pipette. The complete reaction requires from



Shattuck, H. F., and Imboden, H. M.: Chronic Intermittent Duodenal Obstruction. *J Am Med Ass* 924, xviii, 943

Chronic intermittent duodenal obstruction has been called "arteriohepatic occlusion," "congenital fixation," and "stenosis of the duodenum," "megaduodenum," "chronic duodenal ileus," and "chronic duodenal stasis." The two most frequent and important causes are peritoneal adhesions or bands fixing the first and second parts of the duodenum and pressure of the mesenteric pedicle or a sharp occlusive angle at the duodenojejunal flexure causing obstruction of the third part.

The authors review forty-six cases in which the period of observation ranged from six months to eight years. Most of the patients were between twenty-five and thirty-five years of age. There were four times as many females as males. The symptoms were variable, vague, and non-characteristic. The most common symptom was a feeling of epigastric fullness and flatulence especially after meals. Several of the patients had had digestive disturbances such as constipation, vomiting, and bilious attacks since childhood. Forty per cent had pain. As a rule the pain was epigastric. It occurred immediately or from one to three hours after eating or was continuous. It was relieved partially or completely by sodium bicarbonate, belching, coemias, or the knee-chest position. It usually ceased when the stomach became empty. Nausea and vomiting occurred in nearly all per cent of the cases, and constipation in nearly all. In about half of the cases there were toxic symptoms such as headache, migraine, excessive fatigue, lassitude, mental depression, insomnia, nervousness, emotional instability and difficulty in mental concentration. The majority of the patients were of the asthenic type with a narrow chest angle and a broad pelvis, and had a low blood pressure, poor muscular tone, hyperactive reflexes, and signs of vasomotor instability. In more than half of them a diffuse epigastric tenderness was found.

Gastric analysis was negative. X-ray examination revealed varying degrees and types of duodenal distortion, but nothing characteristic of the condition.

The great majority of cases of chronic intermittent duodenal obstruction respond unsatisfactorily to medical treatment, but in a few cases conservative surgical measures are necessary.

CHARLES F. DOBBS, M.D.

DeBouk, F. et De Roux, Bert, and De Witte:  
Chronic Duodenal Stasis (La stase duodénale chronique) *Bulletin-méd.*, 1924, xli, 35 305 306.

The types and causes of chronic duodenal stasis are classified by the authors as follows:

#### A. Mechanical stasis.

1. Due to conditions intrinsic to the duodenum.

- a. Congenital malformations (1) atresia, (2) stricture, (3) peritoneal bands or valvulae from abdominal mobility and (4) megaduodenum.

- b. Acquired lesions (1) stenosis from cicatrization or inflammatory scarring of the parietal peritoneum, (2) stenosis from benign or malignant duodenal tumors, and (3) obstruction from foreign bodies.

2. Due to conditions extrinsic to the duodenum.

- a. Congenital malformations (1) compression stenosis or stricture from fetal membranes, (2) annular pancreas, and (3) abnormal insertion of the ligament of Treitz.

- b. Acquired lesions (1) compression stenosis or stricture due to periduodenal inflammation, (2) retracted mesentery (3) mesenteric pedicle, (4) bands through the ligament of Treitz, and (5) periduodenal tumors.

B. Stasis from duodenal paralysis secondary to inflammatory processes (duodenal ileus).

Intrinsic inflammatory processes of the duodenum.

- a. Essential duodenitis (gastropyloroduodenitis, red stomach).
- b. Ulcers of the duodenum.

3. Extrinsic inflammatory processes of the duodenum.

- a. Cholecystitis.
- b. Pancreatitis.
- c. Appendicitis.
- d. Endocolitis.
- e. Utero-salpingitis.

C. Stasis secondary to nervous incoordination of the duodenum.

Essential duodenal atony (sympathicotonia).

2. Essential duodenal spasm (vagotonia with hypersecretion).

An understanding of duodenal stasis requires a knowledge not only of the normal anatomy of the duodenum, but also of congenital variations such as kinking from traction by the duodenojejunal or duodenojejunoileal ligament or congenital ligaments attached to the liver or transverse colon. Such abnormalities, failure of the entire duodenum or parts of the duodenum to undergo normal rotation, and compression of the duodenum by the superior mesenteric artery and the mesentery of the ileum are discussed by the authors and shown by anatomical sketches.

Stasis secondary to inflammatory processes extrinsic to the duodenum is explained by discovery of the inflammatory process. Stasis due to nervous incoordination of the duodenum may be characterized at one time by spasticity of the duodenum and at another time by tonus of the duodenum in which there is neither clinical nor roentgen evidence permitting a diagnosis. Definite evidence for a pre-operative diagnosis is lacking also in the so-called essential duodenitis or "red stomach" of Schoemaker.

When the superior pancreaticoduodenal, the superior mesenteric, and the pancreatic branches of the splenic arteries were stripped of their adventitial coat and painted with phenol, they first contracted and then dilated and caused hyperæmia of the gland. As a result there was a change in the glyceregulatory apparatus causing an increase of the blood sugar to between 0.25 and 0.35 per cent above the pre-operative values. The increase reached its maximum from ten to twenty days after the operation, the values then returning to approximately normal in from thirty to fifty days.

The test of alimentary hyperglycæmia after sympathectomy showed a change in the hyperglycæmia curve due to a more accentuated reaction which persisted longer than normal.

The effect of sympathectomy on the superior pancreaticoduodenal artery alone was almost as marked as that produced by sympathectomy on all three arteries.

From ten to twenty days after the sympathectomy small zones of coagulation necrosis were found distributed in the gland without any particular order. In a month or two these disappeared. The entire gland was hyperæmic. A. Louis Rosi, M.D.

#### MISCELLANEOUS

Trinchera, C. Diagnostic and Prognostic Criteria of Acute Abdominal Syndromes (Criteri diagnostici e prognostici su sindromi addominali acute). *Arch ital di chir*, 1931, **xxx**, 381.

Trinchera studied the xanthoproteic reaction, the results of the bengal-rose test, the biliary plasma index, the chloride and urea content of the blood,

and the indican, acetone, biliary pigment, chloride, and urea content of the urine in the cases of patients with intestinal obstruction, strangulated hernia, and general peritonitis. As a control to these clinical studies he made analogous studies on dogs.

In the xanthoproteic reaction, biliary plasma index, bengal-rose test, blood urea, and urinary indican he noted a constant increase to as much as twice the normal in acute intestinal obstruction, but only transient changes in chronic intestinal obstruction. The maximal change of three times the normal was observed in acute intestinal obstruction complicated by peritonitis and in diffuse peritonitis. In strangulated hernia the increase was slight in cases in which resection of the strangulated loop was not done whereas in cases in which resection was performed it was considerable.

The author believes that these determinations may be of value in the diagnosis and prognosis of acute abdominal conditions. PETER A. ROSI, M.D.

Wiese, H. W., and Larimore, J. W. Roentgenology of Extra-Alimentary Tumors. *Am J Roentgenol*, 1932, **xxvii**, 383.

Wiese and Larimore made roentgenoscopic and roentgenographic studies of the gastro-intestinal tract in 126 cases of abdominal tumors. They emphasize the value of the lateral view in revealing displacements of the stomach and intestines. In the cases reviewed the topographic alterations in the tract indicated whether the tumor was intraperitoneal or retroperitoneal and usually gave strong presumptive evidence as to its origin. These findings confirmed the clinical findings or alone supplied the necessary data. CHARLES H. HEACOCK, M.D.

ten to fifteen minutes. The results are read by turning one a back to the window and holding the tubes in front of white paper.

In tubes rich in bilirubin a violet-colored contact ring appears. This is less noticeable in the higher dilutions. Prepared tubes of artificial sera, hypocholesteric sera, and albuminous sera with bilirubin are used as standards for comparison. The method is rapid and sensitive.

KAZUOON SYEN, M.D.

Leo, R.: The Ideal Cholecystectomy (La colecistectomia ideale). *Arch. Ital. di chir.* 1933, xxx, 633.

Leo reviews the general and technical problems of cholecystectomy with and without drainage, with subserous removal, and with no attempt to peritonize the gall-bladder bed. He then describes a cholecystectomy without drainage in which the stump of the cystic duct is covered with a pedunculated flap of peritoneum dissected from the more distal portion of that duct before it is sectioned, and the gall-bladder bed is peritonized with the use of a special U type of suture which facilitates hemostasis and biliary stasis.

PETER A. ROSE, M.D.

McClure, C. W., and Hantsinger, M. E. Pathologic-physiological Studies on Changes in the External Secretions of the Pancreas and Liver. *New England J. Med.* 1934, cxxv, 307.

The purpose of the studies herewith reported were (1) to ascertain the reason for the wide variation in the results of determinations of the enzymes in the duodenal contents reported by different observers, (2) to make a more comprehensive study with relatively exact methods of the findings in various clinical conditions, and (3) to determine the possible relationship between functional disturbances of the liver and pancreas.

The duodenal tube was introduced in the morning about fifteen hours after the last meal. After the tip had entered the second portion of the duodenum as determined with the fluoroscope, 5 c.cm. of oleic acid and 30 c.cm. of warm tap water were introduced through the tube. The duodenal contents were then collected and analyzed for their content of pancreatic enzymes. In the biliary fraction estimations were made of the substance giving a modified Pettenkofer reaction expressed as the "furfural number" of cholesterolin, and of the two types of pigment, one insoluble and one soluble in alcohol.

The normal duodenal contents obtained either during fasting periods or when digestion is progressing are mainly a mixture of bile, gastric contents, and pancreatic juice.

In the authors' investigations studies were made of patients with cirrhosis of the liver, toxic jaundice, cholecystitis, cancer of the pancreas, uncomplicated duodenal ulcer, and miscellaneous conditions, and of patients who had been subjected to cholecystectomy.

In all cases of demonstrable organic lesions affecting the liver or its duct system, the biliary findings in the duodenal contents were abnormal. The occur-

rence of jaundice in these conditions is usually ascribed to mechanical obstruction of the common duct or the cannaliculi of the liver. However, comparisons of the concentrations of the biliary constituents of the duodenal contents in persons with and without jaundice and with or without biliary disease showed that bile comparable in concentration and composition was frequently secreted by all. This observation suggests that some factor other than obstruction may be necessary for the development of clinical jaundice. The most obvious additional factor is a functional disturbance within the hepatic cells.

The presence in the duodenal contents of patients with toxic jaundice of at least two pancreatic enzymes in normal concentration shows that there is little, if any, obstruction of the ampulla of Vater. This finding excludes the presence of a so-called mucous plug as the cause of the jaundice. The qualitative changes in the biliary function were so marked as to demonstrate functional disturbance of the hepatic cells. The demonstration of hepatic dysfunction and patency of the ampulla of Vater adds confirmation to the conception that toxic jaundice has its origin in functional disturbances in the liver cells.

Following cholecystectomy the biliary fraction was always abnormal. The authors believe that hepatic functional disturbance, and not changed mechanics within the biliary ductal system, is the major cause of the qualitative changes which not infrequently occur in the bile in the absence of disease of the gall bladder or demonstrable organic involvement of the liver.

The complete suppression of pancreatic juice in a patient with acute yellow atrophy and the frequency with which evidences of enzymic abnormalities were associated with cirrhosis and toxic jaundice suggested an interrelationship between hepatic and pancreatic functional mechanism. This was indicated also by the observation that when pancreatic disturbance was demonstrable in cases of ulcer and cholecystitis it was associated with abnormal biliary findings. The mild dysfunction found when the pancreas was embedded in malignant growths was probably due to circulatory interference caused by pressure. Such dysfunction was the earliest objective sign demonstrable in two patients with malignant involvement of the retroperitoneal glands.

CHARLES F. DEBOIS, M.D.

Caporale, L., and De Ferrao, G. Sympathectomy of the Arteries Supplying the Pancreas (Sulla simpatectomia delle arterie che irrora il pancreas). *Arch. Ital. di chir.* 93, xxx, 4, 1.

Following a brief review of the literature the authors report a series of experiments carried out on dogs in which they studied the effect on the sugar content of the blood and alimentary hyperglycemia of sympathectomy on the arteries supplying the pancreas and investigated the pathological histology of the pancreas after this operation.

The first case was that of a woman forty-nine years of age who had a follicular carcinoma of the cylindrical type with diffuse peritoneal metastases. Transplantation of the tumor tissue from this patient into immature mice failed to cause a reaction in the genital tract of the experimental animals. This was contrary to the expected result as the tumor contained follicular elements.

The second case was that of a woman aged twenty-three years who was operated upon for a sarcoma of the ovary. Transplantation of this tumor tissue into immature mice produced the typical vaginal manifestations of estruation and reactions similar to those caused by the injection of follicular hormone. As ovarian sarcomata do not contain follicular elements, the author believes that the reactions observed cannot be attributed to a specific hormone.

Massazza discusses the value of functional tests with neoplastic cells in determining the primary elements from which tumors originated. He believes there is no relation between the reaction of the tumor cells and the germinal elements. He has come to the conclusion that the reactions obtained in experimental animals have a varied significance and a genetic mechanism which is as yet obscure, but is exerted independently of the specific functional activity of the neoplastic cells.

PETER A. ROST, M.D.

### EXTERNAL GENITALIA

Papin, F. Lateral Pyocolpos (Le pyocolpos latéral). *Gynec et obst*, 1932, **xxi**, 111

Lateral pyocolpos is the accumulation of pus in a secondary vagina situated next to the normal vagina and closed below. It is the result of certain double vaginae. While malformations of the female genital organs, especially double uteri, are relatively frequent, lateral pyocolpos is rare.

Papin reports the case of a woman thirty years of age who consulted him in December, 1925, on account of losses of blood from the vagina in the intervals between menstrual periods and pain in the lower part of the abdomen. She had never had a child or a miscarriage.

The cervix was normal. The body of the uterus presented an anterolateral protuberance suggesting a small fibroma. Examination disclosed also physical signs of adnexitis, which, while not very marked, were sufficient to explain the abdominal pain. The condition of the cervix did not explain the regular losses of black blood which had occurred in the intermenstrual periods since puberty.

At laparotomy, the regularity and perfect symmetry of the mass which could be palpated through the uterus suggested a double uterus. The two uteri seemed to unite at the cervix, and it was erroneously concluded that there was a duplicata only as far as the isthmus. The intermenstrual losses of black blood were attributed to the uterine duplicata.

The left uterine body with all its adnexa, which were diseased, and the right tube, which was also

diseased, were removed. The right ovary and right hemi-uterus were left intact.

The operation was followed by considerable improvement. During the two years the patient was under observation she complained of only slight pains in the lower part of the abdomen. The menstrual periods were regular, and the amount of menstrual blood was normal. The intermenstrual losses of black blood no longer occurred.

In 1931 the patient returned complaining of losses of purulent fluid from the vagina. Gynecological examination revealed a small mobile uterus. The cervix was flanked on its left side by a swelling which was difficult to define. Papin decided to perform a total hysterectomy, and section the vagina to remove the uterine cervix which seemed to be the source of the purulent discharge. The right ovary, which was found to be polycystic and enlarged, was also removed. As the resection of the left lateral wall of the vagina was being completed pus flowed from an unexpected cavity. The latter was found to be a second vagina which extended downward the length of the left wall of the normal vagina and terminated in a cul de sac at a depth of 6 or 7 cm. about 4 or 5 cm. from the vulva. Near the top of this cavity appeared the orifice of the cervix of the uterus which had been removed at the first operation. The vagina on the left side was removed. The septum between the two vaginae was of unequal thickness, and in a very thin portion showed several openings. Following the hysterectomy the septum between the two vaginae was resected.

The uterine malformation in this case belonged to Type 2 of the Ombredanne and Martin classification, i.e., two uteri with separate fundi and cervixes joined together, a pseudodidelphic uterus with a second vagina which was blind. It was the latter which permitted the development of the lateral pyocolpos. The author believes that the blind vagina communicated by a small passage with the normal utero-vaginal passage as this supposition explains the clinical history.

Papin operated from above because he had not made the diagnosis of lateral pyocolpos. He states that if the diagnosis is made soon enough it would probably be best to perform the vaginal operation from below. The operation may consist in only destruction of the septum. Extirpation of the canal appears to be unnecessary.

PAGE

Rabinovitch, J. Carcinoma of the Bartholin Gland. *Am J Obst & Gynec*, 1932, **xxiii**, 268

A woman seventy-one years of age gave a history of swelling of the right labium majus for three years. Her health was otherwise unimpaired. The mass occupied the lower two-thirds of the right labium majus, bulged over the introitus, almost obliterated the vagina, and extended inward along the anterior surface of the lower rectal wall for a distance of about 2 in. from the anal orifice. It was irregular and nodular in outline. For the most part it was of a firm consistency, but in certain portions it was

# GYNECOLOGY

## UTERUS

De Gaudino, M. T.: Radium in Uterine Fibromata. *Ann. Chir. et Gyn. (Paris)* 1932, xxxiii, 85.

The author maintains that in the treatment of fibromyomata of the uterus radium serves better than surgery. It causes the tumors to disappear within a few months and permits conservation of the uterus and ovarian function, which is so important in the psychic life of the woman.

Total and subtotal hysterectomies are no longer justifiable. They are mutilating and even when the ovaries are conserved they usually do not give the results hoped for because, after the operation, the ovaries undergo a regression amounting to atrophy.

Conservative operations may compete with radium. Myomectomy, enucleation, and extirpation of pedunculated tumors are justifiable in the cases of young women, but not in those of women about to enter the menopause.

As compared with the conservative operations of Werth, Duran, Bethner, Frouin, Blair, Bell, and Passeron radium has the advantage as in those procedures it is not always possible to leave a sufficient amount of muscle and mucosa to assure the periodical monthly flow.

After treatment with radium a reduction of the size of the tumor is often noted by the end of the second month and should be very definite by the sixth month. If at the end of ten or twelve months, the uterus is still enlarged, and especially if the hemorrhages have recurred, a second application is indicated. In the majority of the author's cases a single application has been sufficient. At the end of year no evidences of the lesion remain, the uterus being of normal consistency and without indurations or scars such as are seen in cases of cancer of the cervix treated with radium.

The author has treated sixty-five cases of uterine fibromatosis with radium. All types of tumors were represented—submucous, subserous, and interstitial. In sixty-two cases the tumors disappeared completely. In one of the three cases in which the treatment failed the fibroid was associated with a malignant ovarian tumor. A few months after the radium treatment the ovarian tumor was operated upon because of the development of ascites, but it had already become generalized. In the second case in which the radium treatment failed it was necessary to use X-ray irradiation to stop the bleeding. The third case was that of a patient suffering from phlebitis who refused a second application of radium although the tumor had been reduced in size and the bleeding had ceased. The largest tumor was an interstitial fibroma the size of a six months preg-

nancy. In three cases in which X-ray irradiation failed, radium caused disappearance of the tumor within a few months. JAMES T. CASE, M.D.

Adler, L.: The Treatment of Carcinoma of the Cervix by Vaginal Hysterectomy and Radium. *Am. J. Obs. & Gynec.*, 1932, xxiii, 331.

The author claims to be the first to use post-operative radium irradiation systematically in the treatment of carcinoma of the cervix. When the peritoneum is closed after extirpation of the uterus, the ureters are protected with sterile gauze and 40 mgm. of suitably screened radium are inserted in each of the parametrial wound cavities. The radium is left in place for from six to eight hours. This is the standard method. When the advisability of radical operation is doubtful and when suspected infiltrations remain in the sacro-uterine ligaments, a 3- or 4-mgm. radium tube is laid in the proper place. Beginning two months after the operation, from six to eight prophylactic caesarean irradiations are given, the radium being placed in the rectum and vagina for about three hours. This prophylactic application of radium is combined principally with roentgen irradiation. As a rule three series of treatments are administered. In the first series nearly the full carcinoma dose is given. These series are applied at intervals of from three to six months.

Four hundred cases have been treated in the manner described without any complications except transitory rises in the temperature. A comparison of the results obtained by the author with those of other surgeons in the same hospital is shown in the following table.

Years	Patients operated upon and still living	
	With irradiation Per cent	Without irradiation Per cent
	94.8	73
3	70	0
	0.8	5
5	58.8	43

E. L. CORNELL, M.D.

## ADRENAL AND PERIUTERINE CONDITIONS

Masaretti, M.: Manifestations of Functional Activity of Tumors of the Ovaries and Their Relation to Certain Utero-Ovarian Reactions (Manifestazioni di attività funzionale i tumori dell'ovaio: loro rapporto con alcune reazioni utero-ovariche). *Folia ginecol.* 1932, xxiii, 53.

In the cases of two women with ovarian tumors the author attempted to determine the presence of specific hormones in the tumors by transplanting pieces of the neoplastic tissue into immature mice.

With the exception of the chondromata, which seem to be implanted on the surface of the iliac bone and protrude from it, the growths inflate the entire bony plate. Among the tumors of the latter type in the authors' cases, two groups could be distinguished, one showing a definite trabeculation but no destruction (the fibroma and the tumor of undetermined type), and the other showing cavities and zones of destruction (the giant-cell tumor and the echinococcus cyst).

By roentgenography it is possible to rule out all malignant growths except osteosarcomata. The differential diagnosis between osteosarcoma, echinococcus cyst, and giant-cell tumor is difficult. Occasionally an inflammatory lesion may present similar difficulties.

A biopsy of the bone may lead to hæmorrhage, infection, and death from septicæmia. This occurred in the authors' case of giant-cell tumor.

Complete removal of these benign tumors is difficult and sometimes impossible. The chondroma implanted on the bony plate is extirpated most easily. In the authors' case the tumor recurred twice locally and the patient finally died in cachexia, but as there was no metastasis, the malignancy was local. In cases showing diffuse involvement of an entire iliac wing when first seen, it seems better to refrain from surgical procedures. Complete excision is impossible and curettage leads to hæmorrhage and secondary infection. Only in early cases with well-circumscribed lesions is complete removal feasible and safe.

GEZA DE TAKATS, M.D.

Davies, J. W. *Abdominal and Pelvic Fasciæ with Surgical Applications*. *Surg., Gynec. & Obst.*, 1932, liv, 495.

Two systems of fascia are found in the abdominal and pelvic regions, the one a thick fibrous sheet which ensheathes voluntary muscle and the other a fibro-areolar layer which surrounds involuntary

muscle and organs. Organs related to the skin develop in the subcutaneous layer, and organs and structures related to the abdominal and pelvic cavities develop in the subperitoneal layer. Areas subjected to pressure by distention of the organ or structure are protected by an increased deposit of adipose tissue in the areolar layer. The vessels traversing the fibro-areolar layer are surrounded by an increase of the fibrous tissue.

The mesenteroid to each müllerian duct forms the lateral support of the adult uterus and vagina. The vagina like the rectum is a muscular tube composed of an inner circular and an outer longitudinal layer of involuntary muscular fibers. It is covered by fibro-areolar tissue. A delicate areolar tissue connects the vagina to the bladder and to the rectum except in the region of the hæmorrhoidal mesenteroid of the vagina. The lateral ligament of the uterus is thinner and wider than the corresponding lateral ligament or mesenteroid of the vagina. The lateral mesenteroid of the vagina is a trapezoid support formed by the vaginal vessels as they traverse the fibro-areolar tissue lateral to the vagina. The antero-posterior flattening of the uterus and the vagina is due to the lateral attachments. The cylindrical shape of the cervix is due to the absence of a lateral attachment and the preponderance of circular fibers. The round and uterosacral ligaments are fibromuscular bundles in which the muscular tissue predominates.

A study of the fasciæ of the pelvis shows that side-to-side closure of the vaginal vault following complete hysterectomy will increase the efficiency of the lateral attachments. Plastic operations increase the general pelvic tone by increasing the tone of the lateral mesenteroid of the vagina. Because of the arrangement of the fascia, postpartum cervical inspections are facilitated by traction which is placed laterally rather than anteriorly and posteriorly.

HARRY W. FINE, M.D.

soft and showed a definite fluctuation. The skin overlying the mass and over the proximal portion of the thigh was reddened. There was no ulceration. The tumor was quite tender to the touch. It was not firmly attached to the skin anteriorly or to the rectum posteriorly. The cervix and uterus were normal, the adnexa were not palpable, and the inguinal lymph nodes were not markedly enlarged.

An incision was made over the right ilium majus and the tumor readily delivered intact.

On microscopic examination the neoplasm was found to consist of various sized masses of epithelial tissue separated from each other by thin bands of connective tissue. When examined with low magnification it showed a very striking resemblance to malignant thyroid tissue in the arrangement of the acini and the lining epithelium.

E. L. CORNELL, M.D.

**Stoianovitch: Vulvar Pruritis and Vaginitides; Bilateral Neurotomy of the Internal Pudendal Nerve; Cure (Prurit vulvaire et vaginitides; sévrotomie bilatérale du nerf honteux interne; guérison)** *Bull. et mém. Soc. méd. de char.* 1931 (vol. 342.

Vulvar pruritus and vaginitides may be associated or occur independently. In either event they offer much the same problem. In general the treatment should be ectotropic. The most common causes are diabetes, alcoholism, intestinal parasites, polyps of the urethra, hemorrhoids, fissures, and the various pruriginous diseases known to the dermatologists. The pruritus is prone to develop in the course of an artificial or natural menopause. Only rarely can it be traced to pathological conditions in the uterus or adnexa. In some cases a most careful examination reveals no cause and the term "essential pruritis" must be applied. For such cases the author recommends section of the vulvar branches of the internal pudendal nerve according to the technique described by Tavel.

The author reports the case of a woman fifty six years old who had suffered anovular pain and burning sensations for three years. Ectision of a fissure relieved the symptoms for only six months, and treatments with the X-ray electricity, epifur injections, and ointments were without effect. Bilateral section of the internal pudendal nerve with careful preservation of the anal branch was followed by complete relief. When the patient was seen three years later the initial anesthesia of the vulva had ceased. At no time had there been any motor disturbances.

ALBERT F. DE GOSSET, M.D.

**Arenas, N: Ecthiomene of the Vulva (Ecthiomene de la vulva)** *Rev. Soc. de obst. y ginec. de Buenos Aires*, 931 2, 467

Arenas reports a case of ecthiomene of the vulva in which he performed a complete vulvectomy with the radio knife. The patient made a rapid convalescence, the wound healing by primary union. Examination about five months later showed no evidence of recurrence.

Following a review of the literature on this type of lesion the author draws the following conclusions.

1. Ecthiomene of the vulva is a rare chronic condition involving the anal, rectal, and vaginal zones. It is manifested by erythema, ulceration, and hypertrophy. Stenosis of the vagina or rectum and a vesicovaginal or rectovaginal fistula may result.

2. There is no accord as to the etiology. The condition is a syndrome rather than a clinical entity, but is sufficiently characteristic to be distinguished from similar conditions of known etiology. It develops slowly. It occurs in women of a low social scale whose hygiene is poor, and usually after syphilis or tuberculosis. It is most common between the ages of twenty five and forty five years.

3. The presence of giant cells of the Langhans type indicates that the condition is a chronic process similar to syphilis and tuberculosis, but the pathological findings are not characteristic enough to indicate the cause.

4. Three clinical types of ecthiomene of the vulva have been described: (1) the superficial scirrhous, (2) the perforating and (3) the hypertrophic.

5. There are few symptoms. The general health is not affected, and there are only minor local disturbances such as itching and burning which can be tolerated. The condition does not disturb menstruation, sexual relations, urination, or defecation until it becomes very advanced. The regional glands are usually not enlarged. The disease is probably not contagious.

6. Ecthiomene of the vulva must be differentiated from phagedenic chancre, ulcerated hypertrophic tuberculosis, cancer, tertiary ulcerative fiss, vulvar elephantiasis, and venereal granuloma.

7. Of the many therapeutic procedures suggested, the majority include the use of the thermocautery or a chemical caustic. The results have not been satisfactory. Complete excision of the vulva is advisable. With the use of the radio knife, bleeding is practically absent, the procedure is safe, and a cure may be obtained.

WILLIAM R. TOMCZAK, M.D.

## MISCELLANEOUS

**Taversier and Pomet: Benign Tumors of the Bony Pelvis (Tumeurs bénignes du bassin)** *Lyon chir.* 932, 222, 9.

Six benign tumors of the pelvic bones are described and shown by roentgenograms: a fibroma, a giant cell tumor, a tumor of undetermined cause, an echinococcus cyst, and two chondromas. These growths are usually recognized very late. The iliac bone may be greatly enlarged before it produces functional disturbances or pain. Growths on the iliac crest may be palpated by the patient, as is one of the authors' cases of chondroma. In the authors' other case of chondroma, the tumor was discovered on the sacrum accidentally during a gynecological examination. Most benign tumors of the bony pelvis are discovered accidentally during X ray examination for some other condition.

With the exception of the chondromata, which seem to be implanted on the surface of the iliac bone and protrude from it, the growths inflate the entire bony plate. Among the tumors of the latter type in the authors' cases, two groups could be distinguished, one showing a definite trabeculation but no destruction (the fibroma and the tumor of undetermined type), and the other showing cavities and zones of destruction (the giant-cell tumor and the echinococcus cyst).

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HARRY W. FINE, M.D.



# OBSTETRICS

## PREGNANCY AND ITS COMPLICATIONS

**Paracelsus Cellin:** The Biological Diagnosis of Pregnancy by the Friedman and Lapham Test (Diagnóstico biológico de la gestación por el procedimiento de Friedman y Lapham) *Prog de la clin., Madrid*, 93: 22, 23.

The Friedman-Lapham test of pregnancy was used by the author in 120 cases of pregnancy, 3 cases in which ectopic pregnancy was suspected, 4 cases of postperal women, 5 cases of hydatiform mole, 1 case of chorionepithelioma, 6 cases of ovarian cysts, 5 cases of carcinoma, 7 cases of myoma, 3 cases of pyosalpinx, 23 cases of amenorrhea not due to pregnancy, 1 case of climacterium, and 3 cases of women in the menopause.

Growth of the follicles was noted in all cases of carcinoma myoma, endocrine disturbances, climacterium, and ovarian cysts.

Follicular haemorrhages and the formation of atretic corpus luteum are characteristic of pregnancy. In the rabbit, haemorrhagic follicles predominate over atretic corpus luteum in the positive reactions and can be easily recognized.

In the 5 cases of hydatiform mole a positive reaction was obtained with 50 per cent dilutions of urine even in a rabbit which died after the third injection. In 4 cases the reaction became negative a few days after removal of the moles. In the other case the positive reaction persisted for two months and led to the diagnosis of chorionepithelioma which later was confirmed by pathological examination. Of the women who were pregnant, 63 had been pregnant for less than three months and 9 had had amenorrhea for only twelve and eighteen days respectively. The diagnosis in the cases of these women was confirmed by roentgen or later examinations. Some of the cases of amenorrhea were cases of pseudocysts. Of 5 cases in which a clinical diagnosis of ectopic pregnancy was made, the 3 with positive reactions were proved to be cases of ectopic pregnancy while of the 2 with negative reactions was a case of hematomatous and the other a case of old hemorrhagic cyst. The author draws the following conclusions:

1. Female rabbits isolated for a certain length of time serve very well for the demonstration of the hormone of the anterior lobe of the hypophysis.

2. The Friedman-Lapham test is specific for pregnancy.

3. In its quantitative aspects the reaction is suitable for the diagnosis of hydatiform mole and chorionepithelioma.

4. The simplicity of the method makes it available to all clinics and laboratories and even to small private institutions.

5. It is much quicker than other tests for pregnancy.

6. It is also more objective.

7. It results in a correct diagnosis in a greater percentage of cases.

8. For these reasons it is to be considered the procedure of choice. W. H. MARRER, M.D.

**Apajalabri, A.:** On the Inflammatory Etiology of Tubal Pregnancy. A Clinicostatistical Study of the Material of the City of Helsingfors (Zur klinisch-statistischen Ätiologie der Tubenmutter schwangerschaft. Eine klinisch-statistische Studie an Material aus der Stadt Helsinki) *Acta Soc med Fennica Helsingfors* 95: 215, 22.

To determine whether the incidence of tubal pregnancy has increased in Helsingfors and, if so, whether inflammation has been responsible, the author reviewed 855 cases occurring in the period from 1901 to 1930.

He found that extra uterine pregnancy has increased about 15 times as compared with the number of mature onces and about 4 times as compared with the number of conceptions, even though the frequency of coereption and the number of deliveries (term compared with the number of mature women have decreased).

He discovered also that the frequency of the most common causes of salpingo oophoritis (bortion, premature delivery and gonorrhea) has increased.

In a review of 305 cases of tubal pregnancy treated in the Gynecological Clinic of the University of Helsingfors in the period from 1901-30, it was found that changes due to a old salpingo oophoritis were present in the stroma of the other side in at least 69 per cent and were as frequent in polymyoma as in multiple vide. 1 primigra vide the most common cause of salpingo oophoritis as presently gonorrhea. Of the multipara vide nearly one-half had had bortion. In more than one third of the cases the last conception preceded the tubal pregnancy had been followed by bortion. In the interval between conceptions usually two years, postperal infection may be regarded as of at least as much importance as gonorrhea in the etiology of tubal pregnancy. The salpingo oophoritis caused by appendicitis seemed not to be factor as tubal pregnancy occurred more often on the right side than on the left side, especially in women who had been subjected to appendectomy. These observations indicate that tubal pregnancy is often preceded by salpingo oophoritis.

The author claims that the frequency of tubal pregnancy and of the usual causes of adnaxia (bortion, premature delivery and gonorrhea) has several clinicostatistical characteristics in common which

suggest a causal relationship. On the basis of the number of mature women and the number of conceptions the frequency of ectopic pregnancy has increased with the frequency of premature delivery, abortion and gonorrhoea. The increase became apparent first after 1908. It has been most marked in women under thirty years of age and more marked in unmarried women than married women.

LOUIS NEUWELT, M D

**Cozzi.** The Content of Hypophyseal Hormone in the Amniotic Fluid and Fetal Urine (Sul contenuto in ormone ipofisario nel liquido amniotico e nell'urina fetale) *Arch di ostet e ginec*, 1932, xxxix, 61

Cozzi reviews briefly some of the principles involved in tests for the hypophyseal hormone. His studies were limited to analyses of amniotic fluid and the urine of newborn infants. In amniotic fluid the Aschheim-Zondek reaction was always strongly positive even after the fluid had been filtered through a collodion membrane. After deproteinization the reaction was very slight, suggesting that the active principle was removed or altered in the process.

In the urine of newborn infants the reaction was always positive on the first day, less positive on the second day, and absent on the third and fourth days.

Substances which stimulate the contraction of smooth muscle and cause vasoconstriction were also demonstrated in the amniotic fluid.

A LOUIS ROST, M D

**Bock, A.** The Diet During Pregnancy (Die Ernährung der Schwangeren) *Klin Wchenschr*, 1931, 11, 2047

The author discusses the metabolic changes occurring in pregnancy and bases his conclusions regarding the diet of pregnant women upon them.

The metabolism of protein is altered in such a way during pregnancy that a much smaller quantity of protein is utilized. Accordingly, nitrogen retention is always present although there is no increase in the residual nitrogen of the blood. The blood as well as the urine contains complex products of protein metabolism. Even in pregnancy toxemia there is seldom an increase in the non-protein nitrogen. Nevertheless the protein intake should be decreased during pregnancy because the metabolism of the protein molecule is decreased. A decrease in the protein intake is of importance especially in toxemias of pregnancy with symptoms of renal damage as in these conditions the excretion of protein products is also rendered more difficult.

The fat metabolism is increased during pregnancy. As a result there is an increase in the formation of the intermediate products of fat metabolism, namely, acetone bodies. A high fat diet during pregnancy therefore results in an increase of acetone bodies in the organism which leads to acidosis. The symptoms may be especially pronounced in cases of toxemia. For these reasons fatty foods such as fat meats, lard, and bacon should be forbidden. The

views concerning the metabolism of fat during pregnancy which were based on the findings of experiments were proved correct during the war. The low fat diet during the war period resulted in almost complete disappearance of pregnancy toxemias especially eclampsia. Pregnancy itself results in an increased deposit of neutral fats. For example cholesterol is increased and during the puerperium is excreted in increased amounts. It is excreted in the bile and the milk. Absence of lactation results in a retention of cholesterol which favors the formation of gall stones.

Of the greatest importance in pregnancy is the metabolism of carbohydrates. A change in this metabolism is evidenced by the excretion of sugar in the urine, especially after carbohydrate intake (alimentary glycosuria). The blood-sugar values are not increased (renal diabetes). Nevertheless the carbohydrate intake is of great importance to the pregnant woman. Carbohydrates constitute her chief source of nourishment and because of their anti-acidosis effect they act to prevent the toxemias of pregnancy. Therefore a carbohydrate intake is not only desirable but also necessary.

The mineral metabolism is of importance to both the mother and the child. It maintains the molecular concentration in the maternal organism and furnishes important elements for the development of the fetal skull. The most important minerals are iron, calcium, and sodium. Iron deficiency in the maternal organism results in abortion. Of most importance in the development of the fetal skeleton is calcium. The calcium deposits of the placenta as well as those in the maternal organism are utilized for this purpose. To maintain these deposits it is necessary to administer calcium. In this way the calcium content of the blood and thereby the calcium metabolism may be increased. Sodium chloride is retained in the tissue cells during pregnancy. As a result there is a pronounced water retention in the cells (tendency toward oedema). This phenomenon is not dependent upon damage to the renal tissue. The salt and water intake should be decreased during pregnancy.

Investigations of vitamin metabolism have not yet progressed very far.

The dietary management of pregnancy should be based upon the facts cited. In order to advise his patients properly the physician especially the gynecologist, must understand the metabolic processes of pregnancy. Regulation of the diet may sometimes constitute an effective prophylaxis against eclampsia.

F SIEGERT, M D

## LABOR AND ITS COMPLICATIONS

**Solomons, B.** Methods of Obstetrical Diagnosis and Treatment at the Rotunda Hospital in 1909 Compared with 1929 *Proc Roy Soc Med*, Lond., 1932, xxv, 312

In the abstract of this article on page 455 of the May, 1932, issue the second conclusion should read

"Non-fixation of the fetal head in primigravida commencing labor is relatively common and amounted in this series of cases to 19.5 per cent of all cases in which the head presented."

Scott, R. A.: Posterior Occiput Presentation. *Am. J. Obst. & Gynec.* 1932, vol. 400.

Of 1,000 consecutive cases of delivery in the Evanston Hospital, Evanston, Illinois, a posterior occiput presentation occurred in 141. In 50 (34.7 per cent) of the latter—20 those of primiparae and 30 those of multiparae—delivery was effected with the occiput in the posterior position. The average duration of labor was seven hours and thirty-seven minutes. In 50 cases delivery occurred spontaneously. In 11 it was effected with low forceps and in 3 it was effected with mid forceps. In only a small percentage of the cases in this group was a sedative given during the first stage.

In 43 (29.9 per cent) of the cases of posterior occiput presentation—20 those of primiparae and 23 those of multiparae—the occiput rotated to an anterior position spontaneously. The duration of labor in these cases ranged from two hours and forty-eight minutes to twenty-seven hours and thirty-three minutes, and averaged eleven hours and thirty-six minutes. Delivery occurred spontaneously in 38 cases. In 10 cases low forceps, and in 1 case mid-forceps were used.

In 50 cases of posterior occiput position the occiput was rotated to an anterior position manually and in 1 case by a Scarsdale maneuver. Of these cases, which constituted 35.4 per cent of the total number 37 were the cases of primiparae and 13 the cases of multiparae. Full dilatation was completed normally in all but 5. In 1 of the latter DeLee's

Incisions were made and in 2 complete dilatation was produced manually. The infant mortality at 5.83 per cent was a little high a fact indicating either an error of judgment or lack of skill in delivery.  
E. L. COHEN, M.D.

### PUERPERIUM AND ITS COMPLICATIONS

Popandopola, I. Birth Shock (Zar Frage des Geburtshockes). *F. d. Dtsch.* 1932, 21: 233.

Birth shock is observed more frequently than is suggested by the literature. In the Russian literature cases have been reported by Genskoft and Mandelstamm. The condition develops suddenly at the end of the third stage of labor without preceding evidence of hemorrhage. The pulse becomes thready and sometimes even imperceptible, breathing becomes shallow and a deathly pallor develops, but the patient remains fully conscious and if kept perfectly quiet recovers rather quickly. The condition is rarely fatal. Most writers on the subject have assumed that it is due to a temporary disturbance of the circulation which causes the blood to collect in the splanchnic area.

In the treatment absolute rest is essential. In some cases blood transfusion is indicated. The author reports a case in which the condition developed after perforation of a dead child. Crude manual removal of the placenta, and tamponade of the uterus. A considerable loss of blood could be ruled out with certainty. The condition became worse as however the patient moved. Recovery followed the transfusion of 650 c.c.m. of blood. The shock could not be ascribed to the obstetrical procedure as it did not follow them immediately.

VON KERNAT (G)

# GENITO-URINARY SURGERY

## ADRENAL, KIDNEY, AND URETER

Cuthbertson, D P, and Jacobs, A Intravenous Urography. Preliminary Observations on the Recovery of Iodine as a Test of Renal Function Following the Injection of Uroselectan *Brit J Urol*, 1932, iv, 36

According to Swick and Heckenback, 90 per cent of the iodine of injected uroselectan is excreted in the urine. When the kidneys are normal, more than half of the injected uroselectan is excreted in two hours. There is a parallelism between the amount of iodine and the amount of urine excreted.

Tourné and Damm found that in the first two hours the content of uroselectan in the blood decreases rapidly and thereafter more slowly. After four hours there is no uroselectan in the blood. Von Lichtenberg concluded that the rate of elimination of uroselectan may be used as a measure of kidney function.

In three cases of normal renal function the authors found that the iodine excretion and urine excretion were parallel, and that the specific gravity of the urine was highest when the iodine content of the urine was highest. Von Lichtenberg found that the specific gravity of the urine was highest after most of the iodine had been excreted.

The authors reject the use of uroselectan as a test of kidney function because the measurement of the iodine content of the urine is too complicated, the conception of uroselectan diuresis is relative and requires many controls, and the measurement of the specific gravity of the urine has given different results in different investigations.

GILBERT J THOMAS, M D

Tixier, L, and Clavel, C The Retroperitoneal Syndrome and the Relation Between Kidney and Gastro-Intestinal Reflexes *Surg, Gynec & Obst*, 1932, liv, 505

Attention is called in this article to cases presenting the symptoms of partial or complete intestinal obstruction in which no pathological condition is discovered at emergency operation and the symptoms are found later to be due to a renal or retroperitoneal condition such as renal calculus, hydro-nephrosis, hæmorrhage, or infection. This syndrome is explained by the action on the intestine of inhibitory reflexes arising in the sensory nerves of the kidney, ureter, or posterior parietal peritoneum.

The authors demonstrated the influence of renal and peritoneal stimulation on gastro-intestinal motility by placing an exploratory capsule in the stomach or intestine of a dog and then taking kymographic tracings of the contractions following stimulation of the kidney, ureter, or posterior peritoneum.

In experiments on guinea pigs they found that the intestine contracted and dilated segmentally following the retroperitoneal injection of normal saline solution. The reflex is produced usually by way of the solar plexus. THEODORE P GRAUER, M D

Buzeu, P, and Constantinesco, N The Study of the Immediate Functional Compensation of the Kidney Remaining After Nephrectomy by Means of the Phenolsulphonphthalein Test (L'étude de la compensation fonctionnelle immédiate du rein restant après la néphrectomie par l'épreuve de la phénolsulphonphthaleine) *J d'urologie méd et chir*, 1932, xxxiii, 19

Following a review of the literature on the immediate functional compensation by the remaining kidney after nephrectomy, the author reports the findings in three cases and the results of a comparative study of the Ambard constant and the phenolsulphonphthalein test in the determination of the functional compensation after nephrectomy. They draw the following conclusions:

1 Because of its reserve functional capacity, a normal kidney is able to assume the function of both kidneys within less than twenty-four hours after nephrectomy.

2 Nephrectomy produces a disturbance in the elimination of inorganic salts and other blood substances upon which the integrity of the alimentary tract depends. Twenty-four hours after nephrectomy the urea is eliminated in a concentration which can be compared with the maximum or normal concentrations. The equilibrium of elimination is re-established in from five to seven hours.

3 After nephrectomy the phenolsulphonphthalein test is of great value in demonstrating functional compensation by the remaining kidney whereas Ambard's constant is uncertain and inconstant probably because of the disturbance of bowel elimination which occurs during the first few days following the operation. FRANK M COCHEMS, M D

Gutierrez, R The Clinical Management of the Horseshoe Kidney III *Am J Surg*, 1932, xi, 345

The author reviews nineteen cases of disease of a horseshoe kidney in which the diagnosis was made before operation. He emphasizes the importance of recognizing horseshoe kidney as the causative factor in the cases of patients complaining of nephralgia, mid-abdominal pain, gastro-intestinal disorders with constipation, and long-standing intermittent attacks of urinary symptoms. The diagnosis is based on roentgen studies.

The plain roentgenogram may demonstrate the position of the kidneys and in rare instances may show the isthmus.

Bilateral pyelography discloses abnormal rotation of the pelvis with the lower calyces pointing toward the midline and the pathognomonic horseshoe triangle.

The treatment may be divided into the medical, the urological, and the surgical.

Medical treatment is indicated in cases with acute infection. For such cases the usual treatment for renal infections is advisable.

Urological treatment consists of pelvic lavage and the use of indwelling ureteral catheters.

Surgical treatment consists of the removal of any pathological factors that may be present, such as calculi, the drainage of infections, or heminephrectomy. For cases in which the symptoms persist after infection has been cleared up and pathological changes have been completely removed the author advocates renal sympsectomy.

J. SYDNEY RITTER, M.D.

**Tabchot:** Contribution to the Study of Diseases of the Congenitally Deformed Kidney (*Contribution à l'étude de la pathologie du rein atteint de malformation congénitale*). *Arch. d'anal. et de physiol. d'organes génito-urinaires* 931: 4, 53.

During the past thirty years renal malformations have passed from the domain of pathological anatomy to the domain of medicine and surgery. Their study has been greatly simplified since the introduction of substances opaque to the X-rays which can be administered intravenously.

The author reports twelve cases of disease in congenitally deformed kidneys, grouping them according to Papin's classification into those of anomaly of form, those of anomaly of number, those of anomaly of position, those of fusion of the kidneys, those of double ureter and those of congenital dilatation of the upper urinary tract.

#### ANOMALY OF FORM

Among the author's cases there was one of anomaly of form. The patient stated that following an attack of gonorrhea he had developed pruritis which persisted for five years. Cystoscopic examination disclosed an inflamed right ureteral orifice and an obstruction of the right ureter at a point 5 cm. from the bladder. At exploratory operation the kidney could not be found. At a second operation it was discovered in the midline and at first was mistaken for the vena cava. It was cylindrical and filled with pus, and extended from the first lumbar vertebra into the pelvis. The ureter was about 6 cm. long and dilated. Nephrectomy was followed by cure.

#### ANOMALY OF NUMBER

An anomaly of number was found in two of the author's cases. The first was that of a man sixty-one years of age who fell on the brake lever of a wagon and soon thereafter passed blood in the urine. With rest in bed the bleeding stopped and the general condition seemed to improve, but ten days later

renal colic with suppression of urine developed on the right side. A diagnosis of contusion of a single kidney was made. Exploration of both renal fossae failed to reveal the kidney. Death resulted from uremia. Autopsy disclosed a large right kidney fixed high beneath the liver. The parenchyma showed numerous hemorrhages, and the pelvis was filled with clots. There was no left kidney vas, or seminal vesicle.

The second case of anomaly of form was that of a young woman who had suffered for two years with a mobile right kidney. The kidney formed a large mass which varied in size. Recently uræmic symptoms, principally a reduction of vision, had appeared. Cystoscopic examination showed only one ureteral orifice. Nephropexy gave complete relief.

Nephropexy performed for hydrocephroids of a single kidney has been reported by Schloffer, Bazy, Tisler, and Pérez.

#### ANOMALY OF POSITION

In three of the author's cases there was an anomaly of position. The first case was that of a man who developed a painful mass in the suprapubic region and fever in the course of acute gonorrhea. The mass was identified cystoscopically as a pyonephrosis. Evidently a pre-existing hydrocephroid had suppurated as a result of the gonorrhea. There was a history of occasional attacks of abdominal pain which dated from infancy and had been attributed to various conditions such as appendicitis and enteritis. A transperitoneal nephrectomy was performed. The kidney which was globular lay anterior to the promontory of the sacrum. There were two renal arteries, one derived from the aorta and the other from the left common iliac artery. The left kidney was in its normal position.

The second case of anomaly of position was that of a woman about fifty years old who complained of fever pain in the lower part of the abdomen, and pressure in the perineum, and gave a history of severe attacks of sciatica. Gynecological examination revealed congenital absence of the vagina. Cystoscopic and roentgenographic examination disclosed a single large kidney occupying the concavity of the sacrum. The ureter was dilated and tortuous, and the renal pelvis contained a large stone. The patient died a few days after suprapubic nephrotomy for removal of the stone and drainage.

The third case in this group was that of a tuberc patient who suffered attacks of renal colic explained by an extremely mobile right kidney which occupied the iliac fossa. As the kidney could not be returned to the renal fossa it was regarded as being ectopic rather than simply mobile.

#### FUSION OF THE KIDNEY

Fusion of the kidney was found in two of the author's cases. The first was that of a young soldier who was kicked in the lower part of the abdomen by a horse. The injury was followed immediately by persistent hematuria. Ten days later the tempera-

ture rose and an egg-shaped mass became palpable in the lower left quadrant of the abdomen. Operation was done because of the continued loss of blood. The left renal fossa was found empty. When the incision was prolonged downward a hæmatoma surrounding the pole of a horseshoe kidney was exposed. The kidney was situated high in the pelvis. Tamponade was followed by uneventful recovery.

The author remarks that horseshoe kidneys are particularly exposed to trauma because of their pre-vertebral position.

In Tachot's second case of fusion of the kidney a calculus was removed from the left pelvis of the deformed organ and ten years later a recurrence developed in the left ureter near the pelvic orifice. An attempt to remove the stone failed because of dense perirenal adhesions. The patient was therefore advised to be satisfied with palliative measures. A noteworthy symptom in this case was radiation of the pain to the left testicle and the glans penis, in itself suggestive of horseshoe kidney. The radiation is explained by the position of the spermatic nerves and vessels which always pass anteriorly to the kidney and may be involved in the perirenal inflammation or may be stretched across the renal mass.

Horseshoe kidneys are especially prone to calculi formation.

#### DOUBLE URETER

The author reports three cases of double ureter. The first was that of a young soldier who for over a year had noted cloudiness of the urine and occasional pain in the left side. Cystoscopic examination revealed two ureteral orifices on the left side. One was placed far laterally and was surrounded by granulation tissue. Neither ureter could be catheterized. The urine from the right kidney was normal. The Amhard constant was 0.075. Guinea pig inoculation with bladder urine was positive for tuberculosis. At operation, the left kidney was found to have two ureters and two separate pelves. The upper pelvis was hydronephrotic and the lower one tuberculous. The deformity followed Weigert's rule that the ureter of the upper pelvis enters the bladder lower and nearer the midline than the ureter of the lower pelvis.

The author's second case of double ureter was similar to the first.

In the third case there was a double ureter on the right side with absence of the left kidney. The diagnosis was made by roentgen examination. The lower pelvis showed moderate hydronephrosis. It was treated conservatively.

#### CONGENITAL DILATATION OF THE UPPER URINARY TRACT

Tachot reports one case of congenital dilatation of the upper urinary tract. The patient, a boy seventeen years old, developed intermittent hæmaturia with cloudiness of the urine, nocturia and frequent urination. Examination disclosed trabeculation of the bladder and bilateral hydronephrosis

and hydro-ureter. A double nephrostomy was performed. The author states that in this type of case there appears to be no obstruction, the dilatation being rather of the essential type like that occurring in the œsophagus, bronchi and colon.

ALBERT F. DEGROAT, M.D.

Chwalla, R. The Surgical Treatment of Chronic Nephritis and Its Results (Die chirurgische Behandlung der chronischen Nephritis und ihre Erfolge). *Ztschr. f. urol. Chir.*, 1931, xxxiii, 192.

As long ago as 1921 Eppinger concluded that decapsulation of the kidney for chronic nephritis is indicated when the menacing stage of acute nephritis with high blood pressure and the oliguria, hæmaturia and tenderness to pressure over the kidney still persist at the end of a month. Volhard maintained that after the failure of internal treatment to afford relief within a month acute nephritis should be treated surgically in order to prevent the development of chronic nephritis. As in chronic nephritis all forms of internal treatment are useless an effective surgical treatment would be of the greatest importance. In acute nephritis certain signs such as acute anuria and increasing oliguria are generally recognized as indicating surgical interference. In spite of general skepticism, Karo contends that decapsulation has a favorable effect in chronic nephritis. Others, among them Kuemmel, have seen good results from this operation in chronic diffuse glomerulonephritis. The success of an operative procedure in chronic nephritis can be judged only after many years of postoperative observation as the disease runs a markedly varied course in which transient improvement may occur spontaneously.

In the cases in which the author obtained successful results from decapsulation the improvement occurred immediately after the operation. Therefore the improvement could not have been of the spontaneous transient type. As all but two of the author's patients were operated upon previous to 1925, the length of time since the operation has been sufficiently long in the majority of cases to warrant judgment of the treatment. In two cases the decapsulation was done because of anuria and uræmia threatening life, in five because of long-continued hæmaturia, and in two, because of nephritic pain. Three of the eleven patients died. Two of those who died had been anuric for some time before the operation and one had a large white kidney with general œdema due to cardiac insufficiency.

As involvement of the heart is always present in chronic nephritis, death is due to the combination of cardiac and renal conditions. The decrease in the strength of the heart action increases the disturbance in the circulation of the blood through the kidney until ultimately the kidney becomes insufficient. When the cardiac condition predominates no surgical treatment of the secondarily diseased kidney will be successful even if oliguria, uræmia, or œdema is present. The cause of failure is the insufficiency of the heart.

The operation does not cure. It only improves. Therefore it should be done as early as possible. In every case of acute nephritis which shows no tendency toward improvement after four weeks of medical treatment decapsulation should be done. As the dangers of the procedure are slight and spontaneous recovery is rare, the operation should be performed more frequently than is the general practice. Local and paravertebral anesthesia and ether narcotics may be used. When acute anuria is present the operation may be delayed at the most forty-eight hours. After that length of time the spontaneous return of diuresis cannot be expected. In the meantime, diuretics and copious amounts of fluid should be given. Deep X-ray treatments and diathermy as recommended by Eppinger may also be beneficial. However if no improvement is obtained in forty-eight hours, only operation will help. The author and Illyés have never succeeded in saving the patient's life when the anuria has lasted more than three days. In the presence of increasing edema operation should be done when the symptoms of renal insufficiency (headache, vomiting, nausea, regurgitation, spots before the eyes, and loss of visual acuity) develop. Increasing elevation of the blood pressure also belongs among the indications for decapsulation. The success of this operation requires the removal of the primary focus of infection. In some cases tonsillectomy is indicated.

Of the author's eleven cases, the tonsils were definitely responsible for the condition in five and probably responsible for it in two. In the remaining four the cause could not be determined.

A. ROSSIGNOL (2)

Nesbitt, R. M.: Acute Staphylococcal Infections of the Kidney. *J Am M Ass*, 93, xviii, 709.

The author reports on forty-eight cases of acute staphylococcus infections of the kidney. He found that this condition occurs in males more frequently than in females, and in the right kidney twice as frequently as in the left. The infection is believed to reach the kidney by way of the blood stream. In 67 per cent of the cases reviewed a distant focus of infection was found. The infection first involves the glomeruli. From there it spreads and many small abscesses are formed in the cortex. Because of the location of the abscesses the renal pelvis is rarely involved and urinary symptoms are rare in the early stages of the disease.

The condition has a sudden onset with pain in the costovertebral area accompanied by chills, fever and malaise. There is a marked leucocytosis. Microscopic examination of the urine is of more importance than cultures as in several cases organisms have been seen with the microscope when cultures were negative. The urine usually shows a trace of albumin.

The infection is self-limiting and usually clears up after about fourteen days. If it persists or the symptoms do not show improvement after the first week the possibility of a perinephritic abscess or a

carbuncle of the kidney should be taken into consideration.

In all except one of the cases reviewed by the author the treatment was expectant. Fluids were forced and a bland diet was given. Drugs did not prove of much value. In one case surgical drainage of three small cortical abscesses was done, but the author now believes that this was unnecessary.

J. STOKES RITTER, M.D.

Constantinesco, P.: Clinical and Experimental Observations on the Pathology of the Ureter (Remarques cliniques et expérimentales sur la physiologie pathologique rénale). *Arch. anal. de la clin. de Vichy* 1931, vii, 193.

The normal physiology of the ureter is not understood well enough for judgment of pathological ureteral physiology. A number of factors in the mechanism of ureteral function still remain to be explained.

The ureter has two distinct functions, an excretory function in association with the renal pelvis and calyces, and an automatic function, which is not evident when the ureter is normal but comes into play in pathological conditions. In the examination of the ureter before ureterography ureteropyelography should be employed. Ureteropyelography is indicated particularly in stenosis, dilatation, diverticulum, and vesico-ureteral regurgitation, and after stricture and nephrectomy.

From the intensity of the motor reaction valuable prognostic information can be obtained. If the spasms are not reflected to the kidney and the cause is removable, the prognosis is good. Atony always indicates a poor prognosis. When once established, it will persist and affect the kidney either by a mechanism which reverses the interaction of secretion and excretion or directly.

In spasms, conservative local treatment directed toward the cause is indicated. In atony conservative treatment may be used only in the early stages. Well-established atony with dilatation always necessitates sacrifice of the kidney and ureter.

FRANK M. COCHRAN, M.D.

## BLADDER, URETHRA, AND PENIS

Van Duzen, R. E., and Looney, W. W.: Further Studies on the Trigone Muscles. The Anatomy and Practical Considerations. *J Urol* 93, xviii, 59.

The authors studied the anatomy of the vesical trigone and the urethra in the female to determine the best method of procedure in the treatment of cystocele.

When the trigonal mucous membrane of the normal bladder is removed, delicate muscle bundles, the trigone muscle, are seen. Above the ureteral orifice the fibers of the muscle bundles are continuous, and below it they pass the urethral orifice and extend downward on the posterior wall of the urethra. The smooth muscle fibers of the urethra

are arranged in two layers, a longitudinal layer and an outer circular layer. Near the internal urethral orifice the muscular coat becomes thickened and blends with the internal sphincter.

The muscles of the bladder, including the trigonal muscle and the internal sphincter, are supplied by the thoracolumbar sympathetics through the hypogastric plexus and the sacral sympathetics. When the thoracolumbar plexus is stimulated, relaxation of the muscles of the bladder wall and the trigone results. Stimulation of the sacral plexus causes inhibition of the internal sphincter and contraction of the muscles of the bladder wall and trigone.

In 1918, Young showed that the internal sphincter is opened by the pull of the trigonal muscle. When the trigonal muscle is injured, the start of the urinary stream is delayed and the sphincter must be opened by increased intravesical pressure. This results in stretching and weakening of the trigone muscle.

Prophylactic precautions against the formation of cystocele are very important. Bladder injury during childbirth must be avoided. Rapid labor, especially with a full bladder, and the indiscreet use of instruments predispose to bladder injury.

Tenesmus and straining at urination more than a month after delivery should suggest trigonal trouble. In mild trigonal injuries with loss of muscle tone the sphincter does not open easily. Sphincteric dilatations have been found to lessen the strain on the injured trigonal muscle. This explains the relief of frequency and tenesmus after the passage of sounds or the cystoscope. The authors recommend systematic and repeated dilatations. For chronic cases they recommend internal urethrotomy. When dilatations fail to give relief, cystoscopy should be done and the muscles about the trigone and bladder neck closely observed. In cases of small cystoceles good results are obtained by scarifying the cystocele area with a diathermy current. As every cystocele is associated with separation of the vaginal fascia beneath the base of the bladder, well-fitting pessaries are very helpful. In frank cases of cystocele it is better to operate early rather than to wait until the child-bearing period has passed.

In conclusion the authors emphasize the importance of care not to overlook secondary ureteral obstruction in cases of cystocele.

MAURICE MELTZER, M.D.

Hyams, J. A., and Kramer, S. E. Prefibrotic Median Bar. *J. Urol.*, 1932, xxvii, 165.

From an extensive study of autopsy material and cysto-urethroscopic findings in clinical cases the authors conclude that fibrosis of the vesical orifice is due to inflammation following surface infection or irritation of the submucosal glands of the vesicle neck and trigone. The inflammatory condition preceding the fibrosis and causing obstruction of the vesicle neck they call the "prefibrotic median bar." This is always associated with an inflammatory reaction in the prostate, seminal vesicles, and ejaculatory ducts.

Cysto-urethroscopy reveals elevation of the sphincter floor with oedema. The area behind the verumontanum is vertical or nearly vertical and the verumontanum is engorged and oedematous. There may or may not be residual urine.

Patients showing prefibrotic changes at the vesicle neck complain more of discomfort or spasm at the internal sphincter than those with fibrotic median bar.

The injudicious use of the punch or cutting current will be followed by exaggeration rather than amelioration of the symptoms. The treatment of choice is routine dilatation and local medication of the posterior urethra and vesicle neck, massage, local treatment of the prostate and seminal vesicles, and applications of heat. THEODORE P. GRAUER, M.D.

## GENITAL ORGANS

Kretschmer, H. L. Benign Hypertrophy of the Prostate. *Surg. Clin. North Am.*, 1932, xii, 67.

Kretschmer states that pre-operative care by the urologist and the internist has decreased the mortality of prostatectomy. In the cases of patients suffering from benign hypertrophy of the prostate with complications such as cardiac disturbances, diabetes, and other general disorders the internist has reduced the risk of operation by improving the general condition. The urologist has prepared the patient for operation by the use of the indwelling catheter or suprapubic cystostomy. Kretschmer says that he had had good results from both types of urological pre-operative preparation. His pre-operative examination includes a chemical analysis of the blood, tests of renal function, cystoscopic examination, a study of a flat roentgen plate of the genito-urinary tract, and occasionally intravenous pyelography. THEODORE P. GRAUER, M.D.

## MISCELLANEOUS

Le Fur and Lamiaud. Urography with Sodium Di-iodo-Methane Sulphate and Its Value as Compared with That of Urography with Lipiodol (De l'urographie au di-iodo-méthane sulfonate de sodium. Sa valeur comparée à celle du lipiodol). *Bull. et mêm. Soc. d'chirurgiens de Paris*, 1913, xliii, 699.

The iodine content of di-iodo-methane sulphate is 68.6 per cent whereas that of iopax is only 51.5 per cent. Di-iodo-methane sulphate is injected in doses of 15 gm. dissolved in 75 c.cm. of water. Roentgenograms are made five, fifteen, and thirty minutes after the injection. Marked renal insufficiency is a contra-indication.

While lipiodol is admirably suited to ascending injections and gives excellent shadows of the urethra, bladder, ureters and renal pelves, sodium di-iodo-methane sulphate is of value because it may be administered intravenously. However, di-iodo-methane sulphate is eliminated much faster than lipiodol and may not produce such distinct shadows.



The use of the two substances is of great aid in urological diagnosis.

GREG DE TARANT, M.D.

Jacqueson, Pecker, Soloff, and Meddons: A Combination of Acridin Salts and Triphenyl-Methane Violet in the Treatment of Gonorrhea and Septicæmic Conditions (*L'association des sels d'acridine aux violets du triphényl-méthane dans la cure de la gonorrhée et des états septicémiques*) *Bull et mém Soc. méd d'hop de Par* 1933, xl iii E.

Following the work of a number of American investigators, particularly Churchill, the authors have tried a combination of gonacrin and Hofmann's violet in the treatment of gonorrhea and septicæmic conditions. Churchman found that the acridin salts have a special affinity for gram-negative micro-organisms while gentian violet has a special affinity for gram-positive micro-organisms.

In sixty-two cases of gonorrhea treated by the authors, a mixture of from 5 to 10 ccm. of a 1:50

solution of gonacrin and an equal amount of a 1:500 solution of violet was injected, an average of 10 dye injections being given. Complete and permanent cessation of the secretion occurred in thirty-two cases, almost complete cessation in nineteen, incomplete cessation in seven and very incomplete cessation in four. The effect on the complement-fixation reaction for gonorrhea was about the same as that of treatment with acridin salts alone. The authors believe that the results would have been even better if Hofmann's violet had been used in all of the cases, as the latter had a better effect than the forms of violet used at first. They are of the opinion also that the effect would have been more favorable if the treatment had been given in the summer instead of the winter as the violet stains are photosensitizers. The results were best in the old chronic cases with mixed flora.

The treatment described gave good results also in two cases of septicæmia.

AUDREY GORE MORRIS, M.D.

# SURGERY OF THE BONES, JOINTS, MUSCLES, TENDONS

## CONDITIONS OF THE BONES, JOINTS, MUSCLES, TENDONS, ETC

Nowicki, S. The Origin of Haematogenous Infectious Osteitis—Osteomyelitis—of the Long Tubular Bones (Die Entstehung der haematogenen Ostitis infectiosa—Osteomyelitis—in langen Röhrenknochen) *Wien med Wchschr*, 1931, 11, 1431

Neither the marrow nor the marrow cavity is the most important and primary site of the disease in bone suppurations. From both animal experiments and clinical observations it is evident that the bone marrow plays a much smaller part than the other tissues of the bone. The author therefore considers the term "osteitis" more correct than the term "osteomyelitis."

Infectious osteitis usually arises by way of the blood stream and in 85 per cent of the cases is due to the staphylococcus. In 6 per cent of cases it is caused by the staphylococcus pyogenes albus, in 3 per cent, by the staphylococcus aureus and albus, in 3 per cent, by the streptococcus, in 15 per cent by the typhoid bacillus, and in 1 per cent, by the diplococcus of Fraenkel.

The typical infection is that due to the staphylococcus pyogenes aureus. In the acute stage there is also a bacteraemia.

Infectious osteitis is an independent disease which is not to be included with the condition designated clinically as "pyaemia." Trauma is of less importance in its development than is generally assumed. Of the author's cases, there was a history of trauma in only 15 per cent. The time of the year is of no importance in the etiology. The condition usually occurs in young persons and is more common in males than in females. In 85 per cent of the cases it is localized in the long bones.

The periosteal vascular system is of special importance in the disease. If this is injured to a considerable extent the superficial layers of the compact portion of the bone undergo necrosis. Even under normal conditions bacteria are to be found in the bone marrow, in the haversian canals, and under the periosteum. For the development of osteitis a great number of particularly toxic micro-organisms must penetrate into the bone. The bacteria remain for a particularly long time in the terminal vessels. They settle chiefly in (1) the subperiosteal vascular spaces especially of the metaphysis, (2) the haversian canals of the superficial layers of the compact portion of the bone, and (3) the terminal vessels of the metaphysis. According to the author's findings, the primary foci develop under the periosteum and in the superficial layers of the bone. The suppurative process spreads rapidly in the haversian canals. The surrounding bone cells soon undergo necrosis

and this rapidly extends to the adjacent trabeculae of the bone. A later result is the formation of a sequestrum. Other consequences of the inflammatory process are resorption of bone and the formation of new bone especially at the surface of the bone. Isolated foci of infection may be formed. These account for the development of subperiosteal abscesses, the Garré sclerosing non-suppurative osteomyelitis, the albuminous periostitis of Olher, and Brodie's abscess of the marrow. Suppuration in the vicinity of the metaphysis sometimes leads to destruction and to dissemination of the process in the epiphysis.

Infectious osteitis runs a different course in the epiphysis than in the diaphysis. As the spongy substance of the epiphysis is rapidly absorbed, bone cavities are formed within a short time. The epiphysis is sometimes completely destroyed within a few days. In association with the suppuration in the bone there is suppuration in the surrounding soft tissues in the form of abscesses and phlegmons. The rarity of inflammation of the lymph glands in the vicinity is characteristic. In osteitis of the epiphysis a serous or suppurative inflammation often develops in the neighboring joints. The author was able to demonstrate this complication in 35 per cent of his cases. MAXIMILIAN HIRSCH (Z)

Hellström, J. Hyperparathyroidism and Osteitis Fibrosa Generalisata. *Acta chirurg Scand*, 1932, 112, 237

The author reviews the findings favoring the view that osteitis fibrosa generalisata is due to hyperfunction of the parathyroid glands and describes the effect of parathyroidectomy on the symptoms of that condition. Of thirty-five cases in which parathyroidectomy was performed, the glands were found enlarged in thirty-three. On the whole the results have been better than those obtained by other methods, but care is necessary in appraising them on account of the shortness of the period of observation since the operation and the possibility of spontaneous remissions.

The author's own material consists of two cases of parathyroid adenoma in which parathyroidectomy was done and one case treated by roentgen irradiation. All of the patients were females. In the first case the removal of an adenoma the size of a Spanish walnut was followed by disappearance of the symptoms in a typical manner. In the second case improvement occurred after the removal of an adenoma somewhat larger than a walnut, but later the condition then became aggravated. Removal of another adenoma the size of a walnut was followed by progressive improvement. In the third case, in which there were symptoms of hyperparathyroidism as

well as hyperthyroidism (basal metabolism +40) roentgen treatment was followed by considerable improvement of the general condition and more pronounced healing processes in the skeleton than the author has found mentioned in any case reports. However the calcium content of the serum remained high, amounting to 14 mgm. per 100 c cm. Iliostatin attributes the favorable result obtained in this case to the effect of the roentgen treatment on the parathyroid as well as the thyroid gland.

Geschickter, C. F.: The So-Called Fibrosarcoma of Bone: Bone Involvement by Sarcoma of the Neighboring Soft Parts. *Arch. Surg.* 932, rd. 23

So-called fibrosarcoma of bone does not arise from the osteogenic portions of the bone. Connective-tissue tumors arising in the latter are either fibroblasts with a tendency toward true bone formation or precartilaginous connective tissue destined to form bone. The fibrosarcoma, which have a connective-tissue origin and invade bone, are not all products of the non-osteogenic layer of the periosteum, but may arise from the investing portion of the periosteum or a smaller connective tissue of the fascia.

Geschickter reviews fifty tumors grouped clinically as so-called fibrosarcoma of bone. Thirty one were found on histological examination to be made up of fibroblasts, spindle cells, or small oat shaped cells. Tumors belonging to this group termed the "fibrospindle-cell series," constitute a true pathological entity. Their malignancy may be graded according to the degree of differentiation shown by the predominating cells. The author has found that their histological composition is a more reliable index to their clinical and pathological behavior than their anatomical location. On microscopic examination it may be determined with a fair degree of accuracy whether a lesion belongs to the fibrospindle-cell group of neoplasms, the neurogenic group, or tumors derived from other soft structures.

Fibrospindle-cell sarcoma is usually not highly malignant. It occurs most frequently after the age of thirty years. It is most common in the lower extremity, especially the lower end of the femur. The swelling is smooth. As it is firmly attached to the underlying bone, interference with function may occur rapidly. The tumor grows quickly and when it is situated near the end of the bone it may extend across the joint and ultimately involve a neighboring bone. A constant finding in the roentgenogram is the shadow of an extra-osseous soft part which is more opaque than the cartilaginous masses seen in periosteal chondrosarcoma and less dense than the true bone formation seen in osteogenic sarcoma. A soft-part tumor extending the area of bone destruction is of aid in the diagnosis.

The prognosis depends primarily on the findings of microscopic examination. The more malignant neurogenic sarcoma and the more highly malignant osteogenic sarcoma must be ruled out. When

there is marked bone involvement it is necessary to grade the degree of malignancy by determining whether the tumor is of, or closely related to, the oat-cell type of neoplasm or whether it resembles, or belongs to the more highly differentiated group of fibrosarcoma.

In cases of differentiated fibrospindle-cell sarcoma, local operation with postoperative roentgen and radium therapy is usually insufficient to prevent a recurrence but, if repeated, may hold the neoplasm in check for from five to ten years. In cases of the undifferentiated oat-cell type of sarcoma it is impossible to obtain any lasting improvement by local excision or roentgen or radium therapy. Therefore primary amputation should be done if the location of the tumor permits.

The author cites fourteen tumors involving bone that might have been related to nerves in the vicinity. In their clinical, pathological, and roentgen characteristics, such neurogenic tumors closely resemble the fibrospindle-cell tumors. Frequently these two types of tumors are not differentiated. While the diagnosis was difficult in the authors' cases, the results of treatment and a careful study of the clinical features verified the microscopic findings. Symptoms referable to nerve involvement were not prominent in this neurogenic group and were apparently due only to pressure caused by the size of the tumor. Disturbances referable to bone involvement dominated the clinical picture. The prognosis for life in cases of neurogenic sarcoma involving bone is not good even when primary amputation is done.

Geschickter mentions briefly unusual forms of tumors arising from the connective tissue anlagen of bone, myosarcoma, and lipoma. He concludes that each of the various entities requires individual treatment. In cases of fibrosarcoma invading bone the disease should be irradiated locally and if a recurrence develops amputation should be performed promptly. For the oat-cell type of fibrosarcoma and the neurogenic sarcoma with involvement of bone, Geschickter advocates primary amputation for anlagen of bone, local excision supplemented by irradiation of the bone for lipoma, local operation, and for rhabdomyoma amputation.

PAUL C. COLOMBA, M.D.

Strauss, H. Enchondromata and Their Treatment (Über Enchondrome und ihre Behandlung). 92. Halle a. S., Dissertation.

The author reviews the more important literature on the causes and pathogenesis of enchondromata. These tumors arise in locations where cartilage does not occur normally. The majority develop in bone. Enchondromata of the soft tissues are rare. When biopsy cannot be done the diagnosis is difficult, even the roentgenogram is often indecisive.

Jeuneburg called attention to the difficulty in differentiating roentgenologically between enchondroma and osteitis fibrosa and particularly between enchondroma and osteitis tuberculous multiplex.

cystoides The initial stages are especially difficult to distinguish

The well-known benign character of enchondromata is not absolute The danger of malignant degeneration increases with age Recurrences and metastases have been reported Nevertheless the use of too radical procedures is inadvisable, simple removal of the growth is preferable

In cases in which operation is contra-indicated by multiplicity of growths in different parts of the body or some other cause, roentgen irradiation may be employed Reports on the effects of the roentgen rays on cartilaginous tissue are scarce

The author reports three cases of enchondroma treated at the clinic at Halle

The first case was that of a sixteen-year-old boy with multiple tumors in both hands and feet and in the right forearm Biopsy could not be done The diagnosis made from the roentgenograms was uncertain In the differential diagnosis it was necessary to consider enchondromatosis and osteitis tuberculosa multiplex cystoides The latter was later diagnosed by biopsy In the meantime the condition was treated with some success by roentgen irradiation

The second case was that of a man twenty-six years old On roentgen examination an enchondroma was recognized in three different locations in the right hand One of the growths, a painful nodule, was removed and five years later one of the other nodules, which had increased in size, was excised Histological examination showed both of the tumors to be benign enchondromata

The third case was that of a girl four and a half years old Roentgen examination revealed zones of lighter shadow in different parts of the left hand Biopsy in one of these zones disclosed a benign enchondroma As operation was not permitted, roentgen treatment was given At each application the entire left hand was irradiated Six treatments were given at long intervals over a period of eighteen months In four, the dosage employed was one third of a skin-erythema dose, and in two, one-half of a skin-erythema dose Later, two more treatments with one-half of a skin-erythema dose were given The filter used throughout was 4 mm of aluminum A roentgenogram made before the last application showed that the process was undergoing further development A STAFF (Z)

Duilière, W L The Chemistry of Muscular Contraction The Present Status of the Problem (La chimie de la contraction musculaire, aspect actuel du problème) *Re belge d sc méd*, 1931, III, 1053

The difficulty of understanding the chemistry of muscular contraction is due principally to the interdependence of the reactions and the fact that they are to a high degree reversible Older experiments gave an erroneous idea regarding the state of living muscle because contractions were usually provoked repeatedly until the muscle tissue became so thor-

oughly fatigued that it was almost like dead tissue In modern experiments, in which micromethods are used for analysis and the work is done rapidly and at low temperatures the changes more than the results of chemical states are considered and new problems have arisen

Emphasizing particularly the physiological work of Hill and Meyerhof, the author takes up in detail the principal known chemical reactions in muscle The important changes accompanying muscular contractions are the transformation of glycogen, which is probably the source of muscular energy, into lactic acid, the transformation of phosphagene into phosphates and creatinin, and the breaking up of the combination of adenylic acid and pyrophosphoric acid into their derivatives

The energy developed in a given muscle may be expressed by the formula  $H = TL/\phi$  in which  $T$  represents the tension on the muscle in grams and  $L$  the length in centimeters It must not be accepted that glycogen is transformed by bursting of the molecule into two molecules of lactic acid, intermediate reactions which greatly complicate the reaction have been discovered Similar complications in the other principal reactions are discussed

While glycogen is of importance in the contraction of muscle, being a primary source of energy, it is no longer considered the sole factor, and extensive problems in physiochemistry have been opened up to speculation

KELLOGG SPEED, M D

Jung, A, and Brunschwig, A Histological Studies of the Innervation of the Joints of the Vertebral Bodies (Recherches histologiques sur l'innervation des articulations des corps vertébraux) *Presse méd*, Par, 1932, VI, 316

The sensory innervation of the vertebral joints is found in the periarticular ligaments, chiefly the anterior ligaments The nerve trunks and nerve endings are not very numerous, but are the origin of important reflexes which immobilize the vertebral column in case of painful movements When the rigidity of the joints is abolished by the injection of procain, there is a great deal of pain throughout the back, which subsides only when the anæsthesia wears off and the back becomes rigid again

The nerves discussed are all non-myelinated and belong to the sympathetic nervous system

GEZA DE TAKATS, M D

Meyerding, H W Spondylolisthesis *Surg, Gynec & Obst*, 1932, LV, 371

Meyerding reviews 207 cases of spondylolisthesis One hundred and forty-eight of the subjects were males The condition is rare before the tenth year of age It is most common between the ages of twenty and sixty years Persons performing heavy labor are affected more often than others The average age at which the condition occurs in such persons is forty years

Spondylolisthesis is usually recognized and is no longer regarded as a rare deformity It may be

present without symptoms. Severe trauma is associated with the sudden onset of symptoms, and chronic strains with the gradual onset of symptoms. The principal symptom is backache with or without referred pain in the legs. The principal cause to which many patients ascribe the condition is trauma. The anatomical factors are congenital defects and instability of the lumbosacral articulation.

The lumbosacral articulation varies in shape and angle. Abnormality of the angle, which may reach 60 degrees, favors instability. Subluxation varies from partial to complete and may be graded from 1 to 4.

Prominence of the sacrum and the fifth spinous process is present to a varying degree. Shortening of the torso, a depression above the sacrum, a broadened appearance of the pelvis, and abdominal creases are characteristic of well-developed subluxation. Depression of the fifth lumbar vertebra, local tenderness, and muscle spasms are common signs. The anteroposterior diameter of the pelvis being lessened, the birth canal in the female is narrowed. Racial translocation may disclose a fixed mass anterior to the sacrum.

Neurological signs are usually absent. Complete paraplegia is impossible at the level of the displacement (the lumbosacral joint) unless traumatic myelitis occurs at a higher level. Parastheses over the saddle area and referred pain are often present.

Lateral roentgenograms are valuable aside in the diagnosis. Anteroposterior views may not disclose the lesion. Congenital anomalies such as separation of the neural arch and spine bifida occulta are commonly observed.

Conservative treatment, including the wearing of corsets and casts, gives some relief but fusion of the third, fourth and fifth lumbar vertebrae to the sacrum is preferable. The latter prevents further deformity and disability, restores stability and will being, and renders the patient able to work.

Rocher H L, and Rendell G. *Marked Spondylolisthesis Due to an Osseous Fissure Between the Superior and Inferior Articular Processes (Spondylolisthesis acetabulata 44 a une fissure osseuse entre les apophyses articulaires supérieures et inférieures J de Mé de Bordeaux 43, 44, 45*

In previous articles the authors reported cases of spondylolisthesis and have shown that the slipping forward of the fifth lumbar vertebra is rendered possible by a separation of continuity between the superior and inferior articular processes. The unstrained vertebral body slips forward, carrying with it the pedicle, the superior articular process, and the transverse process, while the posterior portion, the vertebral arch, remains in place, retained by the inferior articular process. The latter as well as the posterior vertebral arch is often found to be deformed as the anomaly of development involves the whole posterior portion of the vertebra. The posterior fissure or spondylolysis is explained by the embryology of the spinal column.

In this article the authors report the case of a boy eighteen years of age who sought treatment because of pain in the lumbosacral region which is related to the leg. The trunk seemed short and compressed. The lumbar region was diminished in height and the ribs were closer to the iliac crests than in normal persons. Because of these findings the spine seemed abnormally long. The patient had a very acute lumbar lordosis. The emulsion was near the pubic region. A diagnosis of spondylolisthesis was made and was confirmed by the roentgenogram. The anteroposterior roentgenogram showed the classical picture of a pedicle that slipped down. The posterior vertebral arch of the fifth lumbar vertebra was underdeveloped. In fact, only two rudimentary fragments of the vertebral laminae were visible. The fragment on the right, which was shaped like a hook with the concavity upward, was situated at a lower level than the fragment on the left. Between the ends of the laminae there was a fissure due to the absence of the spinous process. The body of the fourth lumbar vertebra was distinct, but was raised because of the slipping forward of the vertebral body due to the descent of the fifth lumbar vertebra.

The lateral and oblique views showed a marked swiveling of the lumbar column and sacrum due to the slipping forward of the fifth lumbar vertebra and backward angulation of the sacrum, the base of which appeared vertical. At this level the fifth lumbar vertebra had slipped toward the superior pelvic arch. It appeared in a vertical position between the base of the sacrum beyond the anterior border of which it clearly projected, and the lower surface of the fourth lumbar vertebra, which was pushed forward.

At the pelvic excavation it was held by a contracted portion, the pedicle which was interposed between the postero-inferior portion of the fourth lumbar vertebra and the base of the sacrum, and separated by a distance of mm. The pedicle was continued upward by a bony mass composed of the clearly visible superior articular process, probably by the transverse process, and by a bony fragment directed backward. On this bony mass rested the inferior articular process of the fourth lumbar vertebra, which was retained by the superior articular process of the fifth lumbar vertebra.

The osseous fissure between the anterior and posterior portions of the vertebrae is due to absence of fusion between the two centers of ossification. It is situated in what the authors call the "articular column" and can occur only in that region because it is at this level that osseous union takes place. It could not occur on the pedicle because in that region the presence of an osseous fissure cannot be explained. That the space between the bony fragments is filled by fibrous tissue which stretches is possible, and even probable, but it is quite certain that this fibrous tissue plays a rôle only in filling in and not of supporting. It could not resist the pressure received by the fifth lumbar vertebra which may cause the latter

to slip forward. It can only stretch gradually, allowing the bony fissure to widen slowly as the fifth lumbar vertebra descends forward.

Mouchet and Roederer contend that anomalies of the susceptible pedicles are never seen in lateral or anteroposterior roentgenograms. Rocher and Roudil were able to find the cause of the disturbance in a simple lateral orthoroentgenogram. PAGE

**Marique, P.** Cysts of the Menisci of the Knee  
(Les kystes des ménisques du genou) *Bordeaux chir.*, 1932, III, 17

Manrique reports the case of a jockey nineteen years of age who was kicked by a horse on the external surface of the left knee and about six months later sought treatment for an elongated tumor the size of half a nut at the level of the joint space. The tumor was fluctuating and sensitive to pressure, but the skin over it was intact. The mass followed the tibia in its movements and was most prominent on flexion of the knee. A diagnosis of cyst of the meniscus was made and confirmed by operation. The meniscus was removed and the leg immobilized for two weeks. Three weeks after the operation active movement was entirely restored and the patient was able to ride without pain and fatigue. The two surfaces of the meniscus were pushed apart by the multilocular cyst.

Cysts of the menisci of the knee are rare. The author has been able to find only sixty-seven cases reported in the literature. Most of the patients were between fifteen and thirty years of age. The cysts generally range in size from that of a hazelnut to that of a walnut, but sometimes attain the size of an egg. The external meniscus is affected most frequently. Sometimes the same meniscus on both sides is affected, but the author knows of no case in which both menisci on one side were involved. The cysts generally increase in size for a few weeks or months and then remain stationary. They never disappear spontaneously. Palpation may be painful and gives a sensation of an elastic tumor or fluctuation. The skin is normal and not adherent to the cyst. As a rule there is joint pain which is not very intense and sometimes irradiates into the popliteal space. There is some limitation of motion. Complete extension of the knee may be impossible or cause intense pain. Flexion may be reduced to 90 degrees. In some cases blocking of the joint may occur but this is unusual. There is a certain amount of muscle atrophy of the thigh and even of the leg. The diagnosis is not particularly difficult but the cysts are occasionally confused with synovial cysts communicating with the joint or with benign giant-cell xanthomata.

The treatment consists of removal of the meniscus. Some surgeons have extirpated the cyst alone, but this procedure is generally followed by recurrence. Some surgeons remove only the anterior half or two-thirds of the meniscus, leaving the posterior horn. This may be very successful, but the author advocates removing the entire meniscus through a

transverse incision. The dissection of the cyst from the joint capsule must be done very carefully. In the case reported in this article the author removed a part of the capsule with the cyst and as a result there was slight lateral laxity of the joint.

Traumatism seems to be a factor in the causation of the cysts. According to one of the two chief theories regarding their pathogenesis, they are the result of embryonic inclusion. According to the other, they are due to cystic degeneration of fibrocartilaginous tissue. AUDREY GOSS MORGAN, M.D.

**Forrester-Brown, M.** Flat-Foot *Brit. M. J.*, 1932, 1, 463

Although most static foot troubles are designated as "flat-foot," there are many cases of definite foot symptoms in which no anatomical abnormality of the foot can be found. For the latter the term "incompetent foot" would be preferable.

Some of the factors which may cause an anatomically sound foot to become functionally incompetent are the toxins of acute illness, especially pneumonia, diphtheria, scarlet fever, and chronic foci of infection, a lack of oxygen, excessive heat or cold, general fatigue from prolonged standing on the feet, and malnutrition, either general (e.g., rickets) or local (e.g., from cramping foot gear). Patients getting up after pneumonia may have completely flat feet. Patients should not wear soft bedroom slippers when getting up after an acute illness, a firm laced shoe should be put on immediately.

While the ankle joint is almost a pure hinge joint, the subastragaloid joint allows a rocking motion roughly at right angles to the plane of the ankle joint. The latter, which is the key to function below the ankle, is held stable by muscles. The muscles which maintain the normal position of slight inversion in weight bearing are the tibialis posterior and anterior. If these are lost, no mechanical adjustment of the foot can restore the normal balance. The midtarsal joints as a whole give flexibility to the foot on uneven ground.

In the treatment of foot conditions the entire leg up to the hip must be considered. External rotation of the leg will result in poor abduction of the foot, which is a vicious position for weight bearing. External rotation may be the result of congenital dislocation of the hip, coxa vara, rickets, or arthritis. Knock-knees and bowlegs have the same valgus effect on the feet.

Calluses under the heads of all of the metatarsal bones mean failure of the intrinsic muscles of the sole to keep the toes flexed and the transverse arch up. Arthritis of the great toe joint may result from too much weight coming in this region. SUBLUXATION or hallux valgus may follow. Spasm of the peroneal muscles or of the Achilles group may occur in flat-foot of long standing. In some cases adhesions may be formed and it may be necessary to break them up before relief can be obtained.

General methods of treatment must include attention to body posture, a diet with an adequate

vitamin content, fresh air correction of faulty alignment of the legs, exercises to invert the heel, as much rest as possible, and roomy shoes. Adhesive strapping may be necessary to assist the tibialis anticus. This may be supplemented by the application of a soft but firm, felt pad. When there is eversion of the os calcis, as is usual, the heel of the shoe may be tilted by an inside wedge. A very small wedge may be applied also under the head of the first metatarsal. The aim is to make the patient walk with the arch raised.

Adhesions should be broken down joint by joint. In order that too severe trauma may be avoided, this should be done without the use of an anesthetic. Peroneal spasm may require anesthesia or complete section of the tendons followed by the application of a plaster cast with the foot in inversion for about six weeks.

Exercises and muscle re-education including heel and-toe walking and the picking up of marbles with the toes, are important.

WILLIAM ARTHUR CLARK, M.D.

### SURGERY OF THE BONES, JOINTS, MUSCLES, TENDONS, ETC.

ARMEDWERTH W. Attempts at Rapid and Permanent Filling of Superficial Defects at the Free Cartilaginous Bone Ends of the Joints (Versuche einer raschen und bleibenden Ausfüllung von Oberflächendefekten an den freien Knorpelknochenenden der Gelenke) *Arch f orthop Chir* 1931 XXX, 435.

The chances for cure of injuries are best in the bony articular ends, capsule ligaments, articular cavity synovial membrane and Hoffa's fatty bodies because of the power of regeneration of these parts. In the superficial cartilage the regenerating power is very slight. On the other hand, injuries of the cartilage that are covered by perichondrium heal readily as the latter furnishes the matrix for the regenerative tissue. These injuries are found in the osteochondritis dissecans of Koenig and the aseptic partial necroses of Ahtanen. In Haebler's experiments the defect was soon filled by firmly attached blood clots which gradually became organized like connective tissue. After about three months the connective tissue membrane showed isolated or confluent islands of cartilage which could not be differentiated from normal cartilage. Even after three hundred and five days the defect was not completely filled and there was no new formation from the edge of the defect.

The histological picture shows the change of the new connective tissue into fibrocartilage which is sometimes transformed later into hyaline cartilage. In spontaneous filling the function of the joint is impaired by the defect. As spontaneous filling does not always occur Payr emphasized the importance of treatment of the wound surfaces of the bone to prevent later articular hemorrhages.

Deep defects of cartilaginous bone should be filled. Payr and Wassertraudinger employed easily

moulded beeswax for the filling. Hoffbein covered patellar bone defects in dogs and rabbits by sewing on partly pedunculated synovial membrane. Up to one hundred and forty days practically no hyaline cartilage appeared. Similar results were obtained with the use of fascia, periosteum, fat, peritoneum, and keratin sac as transplantation material in patellar bone defects. Experiments with cartilage or bone (rib spinous process) as filling material failed because of the poor adhesive power of such transplants. The use of poorly nourished tissues such as meniscus was also unsuccessful.

The author undertook investigations on ten dogs to show that muscle tissue is well suited for the filling of defects in cartilaginous bone because, on account of its richness in blood and its peculiar almost homogeneous structure it is sucked tightly into the opened marrow spaces on slight pressure and therefore requires no other fixation. Moreover it is easily accessible in all operations on joints. In the experiments reported the knee joint was opened from the midline under ether anesthesia by an arched or S-shaped incision and, after extensive luxation, a defect measuring 3 by 6 mm. and 6 mm. deep was made in the cartilaginous bone of the patella with a grooved chisel. The joint was closed by suture of the capsule, fascia, and skin, and the wound covered by a layer of collodion. In roentgenograms made from time to time the transplants in the defects gradually became visible. These experiments demonstrated that muscle tissue is especially valuable for the filling of defects in cartilaginous bone as it becomes firmly attached quickly and fills out well the injured bone-marrow spaces, as can be seen in the microscopic picture. There is no detachment from secondary hemorrhage. In articular hemorrhages that are difficult to control the transplant acts like a tampon. The result was poor in only one of the author's experiments. In this instance the moderately deep defect afforded the transplant poor hold. As weight bearing is important for rapid transformation of the transplant, most of the author's experiments were performed on the site bearing the most weight, the middle condyle. In one experiment, in which the defect was made on the external side of the median condyle, muscle fibers were still found after forty-two days whereas in the other experiments they were replaced by connective tissue after four teen days.

In the histological metaphase the transplanted muscle tissue was destroyed after a few days. Necrotic organization set in as the result of the formation of blood vessels and spindle cells from the marrow. The bone spicules and trabeculae of the injured bone-marrow spaces were resorbed and so changed that the transplant was surrounded by a shell of almost compact bone which closely resembled the subchondral bone. After twenty-two days the transplant was largely replaced by connective tissue rich in spindle cells which formed a covering epithelium and gradually became rounded

and showed definite capsule formation. The transplanted muscle tissue finally formed fibrocartilage. The author assumes that hyaline islands also form eventually. Even with complete filling of the defect the transplant always underwent a certain amount of shrinkage. Arthritic changes were never observed.

H. ENGEL (Z)

Richard, A., and Elbim, A. The Indications and Techniques of Arthrodesis for Coxalgia (indications et techniques de l'arthrodèse pour coxalgie) *J. de chir.*, 1932, XXXIX, 1

The authors review the history of arthrodesis of the hip and describe and illustrate different methods some of which they devised themselves. In one operation a large flap from the external surface of the ilium is turned down and its end secured in the split great trochanter to form a continuous bridge from the femur across the hip joint to the ilium. In another operation a tibial graft is used to span the gap between the femur and ilium. An antero-external and an external operation are described. In a third operation, performed by the anterior route, a flexible tibial graft is inserted between the great trochanter and a region fairly anterior to the ilium.

PHILIP LEWIS, M.D.

## FRACTURES AND DISLOCATIONS

Pfah, B., and Zoellner, F. The Pathology of Wrist Injuries Scaphoid Fractures and Pseudarthroses with Cyst Formation Dislocations and Malacias of the Semilunar Bone (Zur Pathologie der Handgelenksverletzungen Navicularefrakturen bzw. Pseudarthrosen mit Cystenbildung Lunatumluxationen Lunatummalacien) *Deutsche Zeitschr. f. Chir.*, 1931, CCXXXII, 355

In the course of the last three years a cure was obtained in forty-six cases of more or less recent fracture of the scaphoid bone by conservative treatment consisting of immobilization by a plaster-of-Paris splint. In five cases, which had been untreated for periods ranging from eight to thirty-six months, a part or all of the broken bone was removed. Pseudarthroses in cases of fracture of the scaphoid bone are ascribed to especially extensive destruction of the bone about the line of fracture or too long continued immobilization. Removal of the scaphoid bone after poor healing of a fracture gives a good functional end-result.

When treatment can be given at once, dislocations of the semilunar bone should be reduced without operation. In neglected cases (chiefly those which have been incorrectly diagnosed) with typical parasthesias and atrophy of the interossei, extirpation of the bone is advisable. In three of the six cases of recent dislocation seen by the authors primary reduction was possible. In five neglected cases the dislocated bone was removed from the palmar surface of the hand. In two cases there was total necrosis of the bone with, however, some attempt at regeneration of the osseous tissue. In six cases of

necrosis, both poles of the bone were more or less free from necrotic debris. Therefore it must be assumed that the original necrotic process in these cases did not involve the entire bone. Cure of the necrosis may be obtained in such cases by immobilizing the part for one or two years, but this form of treatment is impractical. The results of extirpation of the bone through the dorsal surface of the hand are no worse than those obtained by conservative measures. The patient is unable to do heavy work. The recognition of necrosis of the semilunar bone due to injury is still problematical, but trauma is believed to be an important factor in cases in which the injury was of a type which might have produced a fracture of the bone.

GUSTAV ROSENBERG (Z)

Corret, P. Accidents to Nerves in the Reduction of Congenital Dislocation of the Hip (Les accidents nerveux de la réduction de la luxation congénitale de la hanche) *Rev. d'orthop.*, 1932, XXXIX, 5

The nerves most frequently injured in the reduction of congenital dislocation of the hip are the sciatic and crural nerves. In cases of dislocation which has been present for a long time these nerves become shortened to conform to the shortening of the leg, and when the head of the femur is pulled down and placed in the acetabulum they are sometimes severely stretched. Sciatic paralysis was found by Lorenz in 23 of 755 cases, and crural paralysis was found by Taylor in 9 of 50 cases in which a congenital dislocation of the hip had been reduced. Froelich states that the nerve involvement nearly always occurs in the cases of children between the ages of five and nine years and in cases in which the original shortening was over 5 cm.

The paralysis may develop an hour after the reduction or may be delayed for several hours or even a day. The first evidences of it are absence of a reaction to pinching of the toes and loss of motion in the foot and leg. Later there may be trophic disturbances, especially of the nails.

In a study of dissections made in the case of a newborn child the author found that the mechanism of injury to the sciatic trunk may be compression between the trochanter of the widely abducted femur and the wall of the ischium or sudden stretching. Sudden stretching is especially apt to occur in the external popliteal part of the nerve as this part is more firmly attached at the distal aspect near the head of the fibula. The obliquity of the nerve roots of the sciatic is such that a pull on the sciatic trunk causes the most damage at the fifth lumbar vertebra. Injury to the crural nerve was also found due to sudden stretching. The pathological changes in an over-stretched nerve are probably those of ischaemia from poor circulation in the nerve trunk due to narrowing of the neurolemma.

In the treatment, surgical intervention is rarely required. The paralysis generally does not last more than a year and in some cases becomes cured spontaneously in less than three months. Some surgeons



advise an immediate change in the position of the leg or removal of part of the cast as soon as the paralysis is discovered. The incidence of such paralysis can be reduced by the selection of the proper method of reduction for each patient. If the displacement is more than 3 cm. and the patient is more than five years old there should be preliminary weight traction for from ten to fifteen days.

Accidents to the central nervous system are more rare than accidents to the peripheral nerves. Race seems to play a part in such accidents as they are most common in Jews and orientals. In the cases of all infants the reduction of a congenitally dislocated hip is followed for a few days by jerking of the legs and arms. The child may wake up crying. General convulsions may occur. Such phenomena cannot be explained on other grounds than involvement of the central nervous system. Embolism from venous thrombosis and fat embolism may occur. A fat embolism may produce the same clinical picture as a general convulsion.

The author reports 6 cases of sciatic and crural paralysis. All of the patients recovered from the paralysis in from one to twelve months. In 3 cases it was necessary to remove the cast at the knee. Of 4 patients with involvement of the central nervous system 1 died suddenly a few hours after the reduction, presumably from embolism.

WILLIAM ARTHUR CLARK, M.D.

#### ORTHOPEDICS IN GENERAL

Jansen, M: The Scientific and Social Aspects of Orthopedics. *Surg Gynec & Obs* 93 liv 75

Recently it has been demonstrated that when the pressure is increased the deposition of lime salts in bone increases more rapidly than the deposition of colloid substances. It has been found also that when the pressure is decreased the roentgenogram shows that the bone elements grow thinner and their transparency to the X rays is increased proportionately. Hence it seems probable that in the presence of excess pressure a condition of plasticity of the bone substance develops. As examples of such plasticity Jansen cites the slight flattening of the femoral head in the wide or flat hip socket and the malacia of the sesamiform bone in persons engaged in forcible manual labor.

According to the law of vulnerability of rapidly growing cell groups, injurious agents affecting growing cell groups enfeeble the power of growth of those cells, and the degree to which growth is enfeebled is proportional to the rapidity of growth. This holds good for parts as well as for the individual as a whole. In the individual, the normal development of the muscles demands most of the power of growth because in the adult the muscles constitute 43 per cent of the body weight. After the muscles, the skeleton demands most of the power of growth as in the adult it constitutes 17.5 per cent of the body weight. In the bones, the growth disks grow fastest. Therefore in feebleness of growth it is rational to

expect growth changes first in the anodes, next in the growth disks, and last in the diaphyses of the long bones.

Three degrees of enfeeblement of growth have been established.

1. The slight degree with mere muscle weakness, which is characterized by weakness of the feet, prominence of the abdomen, roundness of the shoulders, and blueness of the hands and feet. This will lead to overgrowth in adolescence.

2. The severe degree, known as rickets. This is characterized by severe muscle weakness. The skeleton lags behind the normal in growth and all growth cartilages are affected.

3. The moderate degree represented by the knock-kneed child with muscle weakness. He is neither too tall nor too small.

Jansen cites cases of the three types of feebleness of growth in which fatigue of the mother during pregnancy was the only injurious influence apparent.

The severe form of feebleness of growth occurs in the first years of life. Unless there is a chronic unfavorable influence, it improves even without treatment. The rachitic child usually becomes knock-kneed when four or five years old. The child with severe enfeeblement of growth during the first years usually lags behind in growth throughout life, whereas the child with only slight enfeeblement of growth outgrows its strength mainly during adolescence. Here again there is a parallelism between the growth changes and the rapidity of growth. It is well known that in the first year the child adds 40 per cent to its length, whereas in the succeeding years the percentage decreases until in the sixteenth year the increase in length is only 2.5 per cent. Therefore in a child born with a certain degree of enfeeblement growth will lag behind the normal less in the course of years. The child with rickets, the knock-kneed child and the overgrown child represent three degrees of enfeeblement.

Enfeebled bone behaves in conformity with the Huxley-Volkman pressure rule where pressure increases growth decreases, and where pressure decreases growth increases. In slight feebleness of growth there is no reserve power of growth as there is under normal conditions. Any exertion exceeding the normal tends toward the development of knock-knees in the overgrown. The overgrown errand boy is especially apt to develop knock-knees if he is obliged to carry heavy parcels.

In the rachitic hand there is a retardation of the growth of the bones which is proportional to the pressure the bones are obliged to resist, and the transition of cartilage into bone is retarded even more than the growth of the bones as a whole.

The normal growth cartilage presents, side by side, three areas: an area of division of cartilage cells, an area of enlargement of cartilage cells, and an area of differentiation. The findings of microscopic examination of a number of growth disks taken from children of the same age who died from different causes indicate that in feebleness of growth

the three processes are retarded in reverse order, viz., differentiation first and most severely, cell enlargement next and less severely, and cell division last and least severely.

In conclusion the author says that the obstetrician, pediatrician, physician, surgeon, ear specialist, and neurological and psychiatric specialist who learn to estimate the degree of their patients' weakness by a glance at the locomotor apparatus will derive valuable information from this estimation which sometimes will enable them to determine the cause and often the nature of the condition with which they are to deal. The laws which govern the development of the locomotor apparatus may serve them as working hypotheses for the solution of the more intricate problems presented by the internal

organs. They may serve also as a guide to treatment. They explain, for example, why lateral curvature is liable to develop in the first years of life, especially in weak children, and why, in that period of rapid growth, the condition is amenable to improvement, whereas in the tenth year when growth is ten times as slow, or in the sixteenth year when it is sixteen times as slow, powerful measures are required for improvement. However the most important conclusion which the laws of growth render justifiable is that the rapidly increasing number of overgrown adolescents in different nations indicates enfeeblement, and that, for the future welfare of such nations, it is urgent that the causes of this enfeeblement be traced and corrected.

FREDERICK A. JOSTES, M.D.

advise an immediate change in the position of the leg or removal of part of the cast as soon as the paralysis is discovered. The incidence of such paralysis can be reduced by the selection of the proper method of reduction for each patient. If the displacement is more than 5 cm. and the patient is more than five years old there should be preliminary weight traction for from ten to fifteen days.

Accidents to the central nervous system are more rare than accidents to the peripheral nerves. Race seems to play a part in such accidents as they are most common in Jews and orientals. In the cases of all infants the reduction of a congenitally dislocated hip is followed for a few days by jerking of the legs and arms. The child may wake up crying. General convulsions may occur. Such phenomena cannot be explained on other grounds than involvement of the central nervous system. Embolism from venous thrombosis and fat embolism may occur. A fat embolus may produce the same clinical picture as a general convulsion.

The author reports 6 cases of sciatic and crural paralysis. All of the patients recovered from the paralysis in from one to twelve months. In 2 cases it was necessary to remove the cast at the knee. Of 4 patients with involvement of the central nervous system 1 died suddenly a few hours after the reduction, presumably from embolism.

WILLIAM ARTHUR CLARK, M.D.

### ORTHOPEDICS IN GENERAL

Jansen, M.: The Scientific and Social Aspects of Orthopedics. *Surg. Gyne. & Obs.*, 93: 11 75.

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centers which, being obliged to act simultaneously on both sides, cause spasms on the normal side

**Fiolle, J.** A Bullet Wound Across the Femoral Vascular Mass Dry Wound of the Vein Spasm or Thrombosis of the Artery (Une balle à travers le paquet vasculaire fémoral Plaie sèche de la veine Spasme ou thrombose de l'artère) *Bull et mém Soc nat de chir*, 1932, LVIII, 309

The case reported was that of a woman in the fourth decade of life who was wounded the evening before she was seen by the author by a revolver bullet which traversed the left thigh at its root, perforated the mons veneris, and buried itself in the right thigh. The wounds bled only slightly, and the patient was able to stand up while waiting for a cab to take her to the hospital.

The intern, finding that there was no further bleeding, that the thighs were not swollen, and that the general condition was excellent, did not call the surgeon in charge. When the author examined the patient the next day he found that the orifice of entrance of the bullet, which was a little in front of the trochanter, and the orifice of exit, which was in the genitocrural fold, were so situated that a straight line joining them would pass perpendicularly through the vascular mass.

The punctiform wounds were not bleeding, and the region traversed was as flat, supple, and normally colored as the corresponding region of the right thigh. It was clear that there was no hematoma or infiltration. The mobility of the limb was slightly reduced. All movements were possible, but were slow. The appearance and temperature of both limbs were alike. There was no pain. On the right side the dorsalis pedis artery was pulsating strongly, but on the left side it showed no pulsations. This was true also of the posterior tibial artery behind the malleolus.

The three possibilities were (1) a dry vascular wound, (2) a contusion with thrombosis without opening of the tunics, and (3) an arterial spasm.

At operation, no blood was found outside the vascular sheath. The projectile had traversed this sheath 1 cm. below the point where the deep femoral detaches itself from the common trunk. Within the sheath there were small clots of black blood which seemed to have come from the vein. One of them which apparently had been forced into the vascular lumen was seized and drawn out with the forceps. A long slender cylinder attached itself to the end of the instrument and as it was removed a violent hemorrhage occurred. This was stopped by pressure below the wound. The vein was three-fourths divided. The lesion was an example of a "dry wound" of a large vein. The artery was normal on its anterior surface, but its posterior wall was infiltrated and reddish. At the site of the contusion it was markedly retracted. Above this site it was large and pulsated strongly, but below this site it showed only attenuated pulsations communicated by the upper portion. The marked expansion above the lesion ceased abruptly below it. The author was unable to determine whether the artery was obstructed or was affected by spasm. It was not opened, but on account of the possibility of subsequent detachment of the parietal scar, Fiolle passed temporary ligatures under the vessel above and below the contused zone. These ligatures were brought out through the operative wound, which otherwise was hermetically sutured. They gave only relative security, but their use was the author's choice between two dangers.

Eight days after the operation the patient's condition was excellent. Slight pulsations of the dorsalis pedis artery were noted. As the pulsations were not completely re-established, the author believes a thrombosis was present. The patient left the hospital on the twelfth day after the operation. PAGE.

# SURGERY OF THE BLOOD AND LYMPH SYSTEMS

## BLOOD VESSELS

Perpiss, V. S.: Our Contributions to the Pathology and Treatment of Varices (Unsere Beiträge zur Pathologie und Behandlung der Varices) *Zentralbl. f. Chir.* 1931 p. 3063

From the results of experiments on animals and the treatment of trophic disturbances of the extremities in patients by sympathectomy or excision of sympathetic ganglia the author has come to the conclusion that the vasomotor reflexes have a concomitant and antagonistic action on the arteries and veins. Sympathetic stimulation causes narrowing of the arteries and dilatation of the veins, whereas interruption of the sympathetic pathways has the reverse effect. The author therefore considers the symptoms of varicose veins, the venous hyperemia, the venous dilatation (varices), oedema, and elephantiasis as evidences of stimulation of sympathetic ganglia. This view is supported by the cases in which he has done sympathetic gangliectomy for varicose veins with complete subsidence of the manifestations. He has treated eight patients in this way, extending from one to two lumbosacral ganglia by the extraperitoneal route. The ganglia were subnormal in size and consistency and on histological examination showed degenerative changes in the cells and interstitial oedema.

The author explains the pathogenesis of varicose veins as follows:

As a result of exogenous (alcohol, tobacco, lead, mercury) or endogenous toxins (rheumatism, disturbances of internal secretion) irritation of the nerve cells of the lumbosacral sympathetic ganglia occurs and by reflex action causes arterial narrowing and venous dilatation. The loss of tone in the vein walls and the permanent overdistention with blood then lead to the typical picture of varices with shrinkage and insufficiency of the venous valves and finally extensive histological changes in the walls of the veins. F. KLASCH (7)

Ipsen, J.: Measurements of the Superficial Temperature of Bedridden Patients, Especially Those with Phlebitis (Hauttemperaturmessungen bei Bettlägerigen, besonders bei Phlebitis) *Acta chirurg. Scand.* 1931, lxxx, 97

In describing a method for measuring the superficial temperature of bedridden patients, Ipsen discusses particularly the comparison of temperatures of the extremities taken with a mercury thermom. etc. The temperature is determined beneath pieces of felt 3 times a day and the average of these readings is taken as the average day temperature. The difference between 3 average day temperatures measured at symmetrical levels is normally less

than 1 degree. The average of 4 consecutive average day temperatures is called the "nivean temperature." The difference between alveolar temperature is normally less than  $\frac{1}{2}$  degree.

These determinations were made by the author in the cases of 100 patients who had no diseases of the extremities or pelvis. In most cases they were made on the feet.

In cases of local inflammation of a foot the temperature of the involved foot is raised. An increase in the temperature in the foot is noted also in cases of fracture and phlegmon even when the latter occur at the upper end of the femur. In the majority of other conditions there is no appreciable rise in the temperature of the foot.

The temperature has been studied by the author especially in post-operative phlebitis.

It is pointed out that in most cases of post-operative phlebitis the *ordema* is not produced by stasis as the extremity is white whereas in complete obstruction of the main stem it is blue and in cases of more superficial phlebitis it is red.

Ipsen studied particularly the white form. It was found that in phlebitis of a lower extremity the temperature of the affected side is from 3 to 4 degrees higher than that of the normal side.

The difference in temperature generally coincides with other clinical symptoms of phlebitis, but occasionally is noted before other symptoms.

When the causes mentioned (local processes, fracture, etc.) are absent a difference in the average day temperature of 1 degree is a sign of phlebitis.

On the other hand phlebitis may be excluded when the difference in temperature remains below 1 degree for one or two days. This fact is of importance as pain is often noted in the extremities after operations. When under such circumstances there is no difference in the temperature for two days, phlebitis need not be considered in the treatment.

Exceptions to this rule are met with in gynecological conditions, in which there is sometimes a difference in temperature of more than 1 degree in the absence of demonstrable phlebitis and phlebitis may result from some pelvic affection without distinct difference in the temperature.

In conclusion the author reviews various theories advanced to explain the development of the temperature change discussed. He believes that it should be regarded as the effect of a reflex from the deep vessels analogous to the effect of Leriche's sympathectomy.

In some cases the difference in temperature has been proved due to a lowering of the temperature on the normal side. The author suggests that this may be explained by compensatory efforts of higher

and irregularity. It causes a fall in the blood pressure, but this is fairly well controlled by giving ephedrin ten minutes after the spinal injection.

Respiratory embarrassment is more to be dreaded than circulatory disturbances, but is much less common.

On the central nervous system percain acts as a convulsant. In its use for spinal anaesthesia a preliminary injection of  $\frac{1}{4}$  gr. of morphin with  $\frac{1}{100}$  gr. of atropin should be given for its quieting effect. For operations on the upper abdomen the analgesia must extend up to the level of the fourth dorsal vertebra. The dosage varies from 8 to 12 c.cm. of a 1:1,500 solution.

Headache is the only important complication and is amenable to treatment. Failures include incomplete analgesia and psychic disturbances.

Percain has been employed successfully by the authors in 110 cases. Two deaths are recorded.

GEORGE R. MCATLIFF, M.D.

Kirschner, M. Experiments in Securing Girdle-Formed Spinal Anaesthesia (Versuche zur Herstellung einer guertelfoermigen Spinalanaesthesia) *Arch f klin Chir*, 1931, clxvii, 755

In its present form, spinal anaesthesia necessitates filling a large portion of the dural cavity with an anaesthetic agent which, because of its toxicity, is not indifferent. Moreover, a wider area is anaesthetized than the operation requires and the unnecessarily extensive anaesthesia is associated with the danger of disturbances in the respiration, heart action, and vasomotor function. Furthermore, the previously estimated amount of the anaesthetic agent must be administered at once, individualization being therefore impossible.

Kirschner uses a method which is free from these disadvantages. He bases his statements on more than 300 cases. His technique produces a circumscribed girdle anaesthesia which is limited caudally and cranially, is movable, and depends in extent upon the amount of the anaesthetic agent used.

With the patient on his side in a Trendelenburg position of at least 20 degrees, spinal fluid is withdrawn and replaced by an equal quantity of air. The air should occupy the highest point in the dural cavity. This depends upon the degree to which the head is lowered. To prevent the spread of the anaesthetic in a cranial direction, Kirschner uses a solution which has a specific gravity less than that of the spinal fluid and floats upon the spinal fluid. A  $\frac{1}{4}$  per cent solution of percain is an effective agent. By varying the size of the air bubble in the dural cavity, the anaesthesia can be obtained at the desired site. Individual dosage is made possible by means of a double syringe. With 50 c.cm. of air on one side, 5 c.cm. of solution on the other, and a common outlet, the syringe permits the introduction of air or anaesthetic according to the requirements of the individual case. The needle must be left in place until anaesthesia is induced. The induction of the anaesthesia usually requires about five minutes. Then, depending upon the level of the anaesthetic girdle and the depth of the anaesthesia, more air or solution is injected.

It has been found that 2 c.cm. of the solution will induce anaesthesia of an operative field of average extent. By injecting 5 c.cm. of air into the dural cavity (with the head down) analgesia of the lower extremities is obtained. When from 15 to 30 c.cm. of air are injected the anaesthesia reaches the nipples, whereas the legs, the nerves of which run through the air in the dural space, are not anaesthetized. Inclination of the body with the pelvis upward must be maintained throughout the operation. Maximal anaesthesia is attained in from five to ten minutes and lasts for from one to three hours. The after-effects are milder than those of methods used previously. Immediately before the spinal puncture 0.05 gm. of ephedrin is given. Because of the locally circumscribed action of the anaesthetic agent, the fall in the blood pressure which constitutes the chief danger of spinal anaesthesia is slight or absent.

F. O. MAYER (Z)

## SURGICAL TECHNIQUE

### OPERATIVE SURGERY AND TECHNIQUE; POSTOPERATIVE TREATMENT

Haldane, J. S., Crowden, G., Paulson, E. P., Hillon, R., and Others: Discussion on the Therapeutic Administration of Oxygen and Carbon Dioxide. *Proc. Roy. Soc. Med., Lond.*, 1932, ser. 6

HALDANE reminded the group taking part in this discussion that in the normal breathing of ordinary air the ventilation of the lung is so regulated that the partial pressure of carbon dioxide in the mixed alveolar air is maintained at a certain level which is characteristic of the particular person, but is usually about 5.5 per cent. An increase in the percentage of carbon dioxide in the inspired air increases respiration mainly by increasing its depth. The oxygen pressure in mixed alveolar air is kept at about 12 per cent, which is sufficient to saturate the haemoglobin of the arterialized blood to about 97 per cent. Priestley believed that the immediate cause of many deaths is a lack of oxygen due to shallow breathing caused by enlargement of the respiratory center. When breathing occurs under normal conditions the addition of oxygen to the inspired air has no noticeable effect. A marked effect is produced only when the blood is insufficiently saturated with oxygen. In all cases the condition of insufficient saturation, if at all marked, is very dangerous as it has cumulative effects on the respiratory center, the higher nervous centers, the heart, and other organs. When the blood becomes insufficiently saturated, the breathing is at first stimulated to a marked extent, but the increased breathing washes out too much carbon dioxide, thereby soon neutralizing the stimulating effect so that it becomes scarcely noticeable even when consciousness is being lost. However, the breathing becomes shallow and frequent because of enfeeblement of the respiratory center.

The therapeutic use of carbon dioxide introduced by Henderson are likely to become even more extensive than those of oxygen. Carbon dioxide should be administered in measured amounts. The purpose of its administration is to tide the patient over a dangerous emergency until his recuperative powers are strengthened.

CROWDEN demonstrated the Drinker respiratory and stated that by America the problem of respiration in cases of gas poisoning and other conditions of asphyxia has been attacked systematically.

HILLON showed by means of graphs the effect of various methods of giving oxygen on the composition of the alveolar air. He stated that the benefit of oxygen administration in pneumonia is not directly proportional to the amount of oxygen given.

HALEMAN expressed the hope that the therapeutic claims made for oxygen and carbon dioxide will not

be pressed too far. He emphasized that we must not be misled into thinking that pneumonia is chiefly an anoxemia. He stated that oxygen is of value in this condition chiefly to tide the patient over emergencies.

HALDANE agreed with Pembrey that in the early stages of lobar pneumonia there is no distinct indication of a lack of oxygen. Accordingly there is no reason for the administration of oxygen in the early stages, but he does not believe it will cause harm.

M. HENDERSON, M.D.

### ANTISEPTIC SURGERY; TREATMENT OF WOUNDS AND INFECTIONS

Albee, F. H. Will Bacteriophage Prove the Ideal Wound Treatment? *Am. J. Surg.* 1932, 27, 14

Following a review of the search for the ideal treatment of wounds from the days of primitive man to date, Albee discusses the present-day methods of treating bone infections and the value of bacteriophage in chronic osteomyelitis. He believes that the success of the Ott treatment of chronic osteomyelitis (rest immobilization, non-interference, and measures to prevent re-infection) is due to the growth of bacteriophage in the wound. In about 24 per cent of his cases of acute and chronic osteomyelitis a specific bacteriophage occurred spontaneously. In 7 per cent in which a specific bacteriophage did not develop spontaneously it was developed in the laboratory and transferred to the wound with good results. In the remaining 3 per cent of the cases, in which the streptococcus hemolyticus was the causative organism, no bacteriophage could be developed.

In Albee's present treatment of chronic osteomyelitis the lesion is exposed and the sequestrum removed. The edges of the disease focus are then removed and a saucer shaped pocket is made. The pocket is packed with vaselized gauze and the extremity then encased in a plaster cast without a window. At from eight to ten weeks the cast and dressings are changed. At that time the wound has usually begun to fill with healthy granulation tissue. If bacteriophage is not formed it is developed in the laboratory and transferred to the wound.

SAMUEL PARSON, M.D.

### ANESTHESIA

Dillhoff, E. H., and Rice, D. H. Percain in Spinal Anesthesia. *Indian M. Gaz.* 1932, 12, 20

Percain, a quinolin derivative is a drug of fairly high toxicity which is increased in toxic conditions. When it is used for spinal anesthesia it should be employed with great care. On the heart it has a depressant action associated with slowing

little effect on resting cells, damage to the normal tissues is minimal

The author describes technical details that tend to increase the hardness of the rays and diminish their dispersion. The increased hardness indirectly increases the difference in the sensibility between the superficial and deep tissues because of the minor absorption of the very hard rays by the skin and the persistence, as a result of the Compton effect, of the strong deep absorption of these rays. Distribution of the fractional doses over a protracted period to allow a desaturation of the dermal cells, and the use of hard rays renders possible the use of large doses of irradiation without danger to the skin.

In clinical cases in which the described method has been used the best results were obtained in neoplasms of the larynx.

In conclusion Picchio discusses the limitations of this form of therapy. PETER A. ROSI, M.D.

Martius, H. The Treatment of Tuberculosis of the Female Genital Organs (Die Behandlung der weiblichen Genitaltuberkulose). *Strahlentherapie*, 1931, xlii, 471.

Under the influence of Hegar it was generally believed, from twenty to thirty years ago, that genital tuberculosis in the female should be treated surgically with removal of the diseased organs, if possible, a procedure associated with a mortality of 10 per cent. As the result of the introduction of roentgen irradiation a complete change of opinion has occurred. However, as genital tuberculosis is a serious condition, it is usually first recognized at operation or at microscopic examination of the specimens after operation. Therefore surgical treatment can by no means be considered as completely abandoned. In peritoneal tuberculosis good results are obtained by simple laparotomy which produces hyperæmia of the peritoneum and thereby usually renders it unnecessary to touch the diseased genital organs themselves. In the opinion of most surgeons the removal of all visibly diseased parts is not indicated. Evmer recommends the partial operation, and von Jäschke performs an exploratory operation to confirm the diagnosis and then irradiates. Relying

on subsequent roentgen treatment, Martius leaves the uterus and ovaries intact when they appear macroscopically sound. Often he is satisfied with exploratory laparotomy. He never operates in a case of genital tuberculosis without trying irradiation first.

With regard to the effect of the roentgen rays Martius says that the amount of the rays is not sufficient to destroy the bacilli. We must assume an immediately stimulating effect on the healing processes inherent in the granulation tissue. Some believe that the granulation tissue is injured and that this injury liberates specific toxins which have a stimulating effect on the organism. Nevertheless it has been repeatedly demonstrated that large doses of the roentgen rays are not advisable.

In the author's cases of isolated genital tuberculosis the lower abdominal region only is irradiated from a distance of 50 cm. With the use of a filter of 0.5 mm. of copper the field is given an initial dose of 110 r, which is equal to about one-fifth of the skin-tolerance dose of 590 r. This irradiation is repeated three times at intervals of eight days, and each time with a dose of 60 r. The number of subsequent irradiations and the length of the irradiation intervals are determined on the basis of the clinical course. In general, one or several repetitions follow such a series after intervals of from six to eight weeks. The dosage applied to the skin surface is increased by the rays reflected back from the body. The ovarian dosage is not attained, a fact which the author, in agreement with others, considers very important. Only in the cases of elderly women and in the presence of severe hæmorrhages, which are very rare, is the ovarian function destroyed by the roentgen rays.

The roentgen treatment must be supplemented by general treatment including a very nourishing diet, rest in bed, natural and artificial heliotherapy, and the injection of old tuberculin (according to Panlow, 0.01 c.cm. once a week). The irradiations and injections should not be given simultaneously. Von Jäschke recommends caseosan therapy. Soap injections of the skin and sanitarium treatment are also recommended. H. FURTH (G)



# PHYSICOCHEMICAL METHODS IN SURGERY

## ROENTGENOLOGY

Laurell, H.: A Method of Excluding Most of the Unfavorable Secondary Irradiation in Roentgenography (Eine Methode beim Roentgenphotographieren den grosseren Teil der schädlichen Sekundärstrahlung ausschalten) *Acta radiol* 1931 xli, 374.

The author describes a method of obtaining distinct roentgenograms with hard roentgen rays and without the use of the Bucky diaphragm. This is done by having long distances between the X ray tube, the object, and the X ray film. The time of exposure is not particularly prolonged.

An ordinary roentgen therapy tube may be used for the roentgenography and while X-ray treatment is going on several patients may be roentgenographed at the same time and with the same tube.

Pons, A. P., and Sabater J. M. V.: Investigations on Hepatosplenography with Thorium Preparations. Thorotrast (Investigaciones sobre la hepatosplenografía mediante los preparados de thorio Thorotrast) *Rev. med de Barcelona* 1931 lx, 4.

Thorotrast is a 25 per cent colloidal solution of thorium dioxide. For roentgenographic visualization of the liver and spleen it is injected intravenously. It may be administered without preparation of the patient. The optimum dose is from 60 to 80 c.c.m. given in three injections at intervals of from one to three days. The initial dose is from 0.4 to 0.6 c.c.m. per kilogram of body weight. In order to decrease the amount of gas in the intestines it is advisable to give medicinal charcoal and an enema before the roentgen examination. The roentgenograms are usually taken forty-eight hours after the last injection. However sufficient contrast may be obtained twenty-four hours after the initial minimal dose of from 30 to 40 c.c.m. and up to twenty days after the last injection. The roentgenograms are taken with the patient in ventral or lateral decubitus.

The authors report fourteen cases in which hepatosplenography was done with thorotrast. The average dose was 75 c.c.m. In one case 175 c.c.m. were used, but the contrast was not improved. The cases included two of hydatid cyst, one of leukemia, three of pulmonary tuberculosis with enlargement of the liver and spleen, one of amyloid, and seven of miscellaneous conditions.

In this series no febrile reaction, malaise, head ache, or tingling was noted. One patient with anemia and loss had dizziness, abdominal discomfort, chills, twitchings, and tachycardia but these ceased after the administration of caffeine and adrenalin and were prevented after later injections by the previous administration of adrenalin.

Hemorrhagic phenomena occurred rather infrequently. They included slight epistaxis, bloody sputum, and severe hematemeses and melena. Two patients with advanced hepatic cirrhosis died apparently as the result of hemorrhage.

The effects of thorotrast on the blood picture and hepatic function were studied in a few cases, but no conclusions could be drawn.

The elimination of thorotrast is slow. In some of the authors' cases the shadows remained unchanged after three months. The routes of excretion of the drug are unknown, but the authors believe that the liver and kidneys are concerned in the elimination. They have found thorotrast in the bowels following its intravenous injection.

The authors' conclusions are summarized as follows:

1. In roentgenograms made after the intravenous injection of thorotrast the normal liver and spleen are well contrasted.

2. Besides showing the size, shape, and contour of these organs, the use of thorotrast may be of value to demonstrate cysts, abscesses, and new growths.

3. In cases of diffuse tumor invasion, advanced hepatic cirrhosis, and leukemia, the shadows may be absent.

4. Thorotrast has no immediate toxic effects on patients in good condition, but its late effects are still unknown.

5. Its use is contra-indicated in leukemias and hemorrhagic states. W. H. MAXWELL, M.D.

Picchio, C. Roentgen Therapy with Fractional and Protracted Doses (La roentgenoterapia dos fraccionata e protratta) *Radiol med* 1932, xix, 1.

Picchio reports his experimental results from roentgen therapy with fractional and protracted doses according to the method proposed by Coatsard. He describes the technique in detail and cites its advantages over the ordinary forms of therapy with massive doses. He was able to obtain considerable improvement with this technique even in cases of neoplasms in which other forms of roentgen therapy have had only a limited effect.

In discussing the physical and biological bases to which he attributes the advantages of the method, he emphasizes the importance of distributing appropriate doses over a period of time sufficient to allow an elective action of the irradiation on the neoplastic cells with maximum preservation of the normal tissues. The small doses probably affect neoplastic cells only during mitosis, when the cells are most radiosensitive. In the administration of fractional doses over long period of time the attempt is made to irradiate the tumor cells during their most radiosensitive stage. As small doses have

In the third case, a man fifty-six years old sustained a fracture of the left tibia and the external malleolus in a fight on May 14, 1926. On the patient's admittance to the hospital a hematoma was found on the right thigh. The hematoma subsided under treatment with moist compresses. Three weeks later there appeared at the site of the hematoma formation a small tumor which became progressively larger. Extirpation at the hip was advised but was refused. The tumor was excised on July 2, 1926. The histological diagnosis was polymorphous-celled sarcoma. Death occurred from cardiac failure on the evening of the day of operation.

In the fourth case a thirty-four-year old woman stumbled against a pile of stones early in December 1929, and sustained a hematoma on the external side of the right knee. Under treatment with moist compresses and by massage, the swelling subsided to a small, firm mass. Later, the mass enlarged and on the patient's admittance to the hospital on March 3, 1930, a fist-sized, firm tumor was found on the outer side of the right knee. The growth of the tumor could not be controlled by roentgen irradiation. On March 17 amputation was done through the middle of the thigh. The histological diagnosis was polymorphous celled sarcoma. Death occurred in May, 1930 from pulmonary metastases.

In the fifth case a woman eighty-two years old struck her head against the branch of a tree sustaining a wound on the left side of the forehead. In spite of medical treatment the wound failed to heal. On the patient's admittance to the hospital on March 20, 1931 an ulcer surrounded by scar tissue was found on the left side of the forehead. The ulcer was excised. The histological diagnosis was basal-celled carcinoma. The patient was discharged as cured on March 29.

In the sixth case a man forty-six years old sustained an injury to the left arm and chest from a shell splinter on September 27, 1914. The wounds healed smoothly. In August, 1925 the patient noticed a growth in the scar. Under roentgen irradiation the growth disappeared almost entirely. On May 31, 1926, a fist-sized firm tumor was found in the scar in the region of the shoulder blade. The scar, together with the tumor and the major portion of the scapula was removed on June 1. Histological examination of the specimen revealed a basal celled carcinoma. Three months later local metastases the size of peas were removed.

In the seventh case the patient was kicked in the right testicle in December, 1928. A painful swelling appeared but subsided under treatment with warm moist compresses. Three months later the testicle presented a painless swelling which resisted all treatment. On December 17, 1929 the egg-sized, nodular firm testicle was removed. Histological examination disclosed carcinoma. Death occurred in June 1930, from pulmonary metastases.

In the eighth case the patient caught his right thumb on the door handle of an automobile, sustaining a fracture of the proximal phalanx. The fracture

was treated. After four weeks there was a slight thickness of the proximal phalanx. A roentgenogram made November 22, 1926, showed a swelling of the proximal phalanx with a sharply localized rarefaction in its center. The bone was chiselled open and curetted. Microscopic examination revealed an enchondroma.

Such so-called callus enchondromata are particularly frequent after fractures of the humerus and clinically are scarcely less malignant than sarcomata. As the result of the bone injury, regenerative processes occur, the potential growth energy again becomes kinetic. The cells retain their capacity for growth, but can no longer produce bony tissue and remain at the lower developmental stage of the cartilage cell. A similar reaction apparently occurs in connective tissue and epithelial cells when they are stimulated to regenerative processes by trauma. As a result of some influence perhaps the trauma, the regenerative processes of the mother tissues are disturbed and give rise to tumor formation because of unrestrained capacity for growth at a lower stage of differentiation.

In all of the cases reported by the author a definitely single trauma followed by signs of injury was proved and the tumor developed within a certain period of time at the site of the injury. Therefore in these cases trauma must be considered the etiological factor in the tumor development.

HAUMAN, (Z)

Ciantini, F. The Serodiagnosis of Malignant Tumors with Botelho's Reaction and the Stalagmometric Miostagmin Reaction (Contributo alla serodiagnosi dei tumori maligni con la reazione de Botelho e miostagmica stalagmometrica) *Clin chir*, 1932, VIII, 63.

Botelho's reaction depends upon the formation in the blood serum of a precipitate in the presence of an iodine solution and citric acid. It is claimed that in cases of cancer a precipitate is produced when the amount of iodine solution is extremely small. The author used the Botelho test on forty-four patients with cancer and twenty-six controls. The reaction was positive in 77 per cent of the former and 50 per cent of the latter.

The miostagmin reaction measures the lowering of surface tension in diluted blood serum when the corresponding antigen is added. The measurement is carried out with a special pipette called a "stalagmometer." Of thirty-one patients with cancer, 61 per cent gave a positive reaction, whereas of twenty-one controls, 24 per cent gave a positive reaction.

Ciantini concludes that the serodiagnosis of cancer is far from being solved. C. D. Hagensen, M.D.

Hueper, W. C. The Clinical Significance and Application of Histological Grading of Cancers *Ann Surg*, 1932, XC, 321.

The author emphasizes the conditions necessary for proper interpretation of the histological grading of cancers. While some have regarded such grading

## MISCELLANEOUS

### CLINICAL ENTITIES—GENERAL PHYSIOLOGICAL CONDITIONS

Cotter, I: Skeletal Disturbances and Anomalies: A Clinical Report and a Review of the Literature. *Radiology* 935, 2961, 992

This report is based on a series of cases observed by the author. The anomalies included syndactylism, hypodactylism, polydactylism, a thumb with three phalanges, ectrodactyly, deficiency of the fibula, absence of carpal bones, fusion of carpal bones and dyschondroplasia.

Stockard and Bagg proved by experimental studies that abnormalities of the limbs are definitely inherited and recessive to normal inheritance, and that skeletal deformities and defects are due to retardation of development at a particular period.

WIMMER J. KERR, M.D.

Dimitri, V: A Case of Dystonia Musculorum Deformans (Un cas de dystonie musculaire deformante). *Semaine med* 93 XXXI, 477.

The case reported by the author was that of a man who was born with congenital mental defects. His parents were alcohol addicts. The condition developed after the subsidence of a acute infectious process. The diagnosis was confirmed at autopsy.

Dimitri believes that in all cases of dystonia or park lesions are present especially in the striated body and cerebral cortex. The condition in this case he reports was very similar to that in a case reported by Wimmer in 1912 as "progressive torsion spasm." In both cases there were choreic movements and involuntary contractions, the progress of the condition was slow and the histological picture showed disturbances in the caudate nucleus, putamen, cerebral cortex and an increase of neuroglia cells. The author's case differs from the case reported by Wimmer in the absence of cerebellar and hepatic lesions.

ALBERTO PERRO, M.D.

Sperling, R. G., Seidman, F., and Rogers, J. B. Observations in Raynaud's Disease with Histopathological Studies. *Surg Gynec & Obst* 932, 17-24.

The authors report three typical cases of Raynaud's disease which were treated by sympathetic gangliectomy. In all of the cases complete relief of symptoms was obtained in the lower extremities and the left upper extremity for periods ranging from six to eighteen months. In two cases the disease was not permanently relieved in the right upper extremity. In one case all of the digits of the right hand were destroyed by dry gangrene after removal of the entire sympathetic chain from the level of the superior cervical ganglion to the third thoracic ganglion

and after periauricular sympathectomy of the axillary artery. Studies of the amputated digits showed sclerotic and hypertrophic changes in the intima and media of the larger arteries both proximal and distal to the line of demarcation. No significant changes were found in the arterioles or veins.

The authors discuss these clinical and pathological findings and their significance as regards the causative mechanism of Raynaud's disease.

JOHN J. MURPHY, M.D.

Todd, E. W.: Antigenic Streptococcal Hemolysin. *J. Exptl Med* 932, 1-57.

There is no convincing evidence in the literature that streptococcal hemolysin is an antigen, and it appears to be generally accepted that the thermostable streptolysin in the sera of normal animals cannot be increased by immunization with streptolysin. Experiments reported in this article show that the absence of antigenic activity is due to the serum used in the preparation of the streptolysin. Hemolytic streptococcal filtrates prepared without serum behave like any ordinary antigen and can be used to titrate the antistreptolysin in the sera of normal or immunized animals. GEORGE A. COLEBY, M.D.

Loewenhard, H.: Malignant Neoplasie and Trauma (Maligne Geschwulstbildung und Trauma). *Monatschr f L Heilkunde* 93 XXXIII, 445.

Among 3500 malignant tumors caused by operative and histological examination there were 25 sarcomata and 273 carcinomata. Nine of the sarcomata and 6 of the carcinomata were attributed to trauma. After critical consideration, 4 of the sarcomata and 3 of the carcinomata were regarded as being the result of single trauma.

The first case reported by the author was that of a 47-year-old man who was struck on the right buttock by a rail on 9/8. In February 1909 a small swelling appeared, and on March 16, 1910, a tumor as large as a child's head was removed surgically. Histological examination showed the neoplasm to be a spindle-celled sarcoma. In November 1910 local recurrence was treated by roentgen irradiation.

In the second case the patient's left foot was frozen in October 1905. The ball of the great toe became swollen and failed to heal in spite of continuous medical care. On August 1906, it presented an egg-sized reddish swelling with a small ulcer in the center. On August 1906 amputation was done through the tarso-metatarsal joint. The histological diagnosis was sarcoma. On November 1906, local recurrence with extensive glandular metastases was found. Death occurred at the end of December 1906.

the tongue, and the pulse Chills may be absent Fever may be intermittent as well as continuous Negative lung findings do not exclude small central foci. However, lung abscesses do not contra-indicate operation When the tonsils are still involved the blood picture is of aid in differentiating particularly monocytic angina, agranulocytosis, and acute leukaemia The principal other conditions to be ruled out are pneumonia, erysipelas, pyelonephritis, and malaria

Early operative treatment—exposure of the large efferent vein as far as the clavicle—is necessary The vein should be examined as far as the peripheral portion of the angular vein above the junction of the facial vein, and the ligation should be done as high and as low as possible

Occasionally infections and erosions of the arteries occur

The advisability of tonsillectomy is dependent upon the general condition and the extent to which the tonsillar bed may be exposed from the outside

With regard to the pathogenesis, the author states that in his opinion the condition is a phlegmonous inflammation This theory is supported by the histological findings of Burckhardt and Joel, Christeller, and Anders The author has seen no case proving Fraenkel's theory that the infection extends only along the veins

Improvement depends upon the operative technique—aëration and drainage of the tissues The prognosis should be guarded LUDWIG JAFFE (H)

Foulger, M., Glazer, A. M., and Foshay, L. Tularæmia *J Am M Ass*, 1932, xcvi, 951

The authors add another case of tularæmia with autopsy findings to the eight they have found in the literature Four days before the beginning of the illness in their case the patient had dressed some rabbits, but the primary papulopustule on the left index finger with its consequent regional lymphadenopathy and subacute ulcer of the finger was preceded by no noticeable abrasion or injury The clinical manifestations of the infection included fever, chills and symptoms indicating pulmonary and gastro-intestinal involvement Death occurred twenty-two days after the onset of the illness An interesting feature was the inoculation of two other fingers apparently from the original lesion on the index finger

Autopsy disclosed, in addition to the multiple abscesses of the lungs, liver, spleen, and lymph nodes which are found in most cases, tularæmic lesions of the peritoneum The serosal surfaces of the gastro-intestinal tract presented a dull granular appearance due to a generalized diffuse reaction of monocytes beneath a layer of fibrinous exudate and showed also focal areas of necrosis identical with early lesions in other organs

The bacterium *tularensis* was demonstrated in the lungs by a new method of staining, the essential feature of which is the use of an aqueous solution of Nile blue sulphate The bacteria were found sometimes in free clumps, but most characteristically within phagocytic cells MAURICE MEYERS, M.D.

as of aid in determining the treatment and prognosis, others have condemned it as being misleading. This difference of opinion may be due to a lack of understanding of the fundamental conditions that must be satisfied before correct application of the method is possible.

The sections submitted for grading must be obtained from the peripheral actively proliferating portion of the tumor. This is the characteristic portion of the tumor as it is free from ulceration, infection, structural distortion, and necrosis. The sections must contain a sufficient amount of tumor tissue to show the histological structure of the tumor and must be free from defects due to improper handling before fixation or to faulty preparation and staining. The pathologist must be familiar with the histopathology of tumors and especially with this type of work.

The purpose of the histological determination of the malignancy of cancers is to estimate the potential proliferative qualities and metastatic tendencies of the neoplasm on the basis of the degree of differentiation and the amount of anaplasia.

As surgery and X-ray and radium therapy are mainly local means for the eradication of cancers and are successful only when the tumors are more or less localized, the practical value of histological grading depends upon its proper clinical interpretation into terms of prognosis and type of therapy indicated.

Clinical experience has demonstrated that immature and highly anaplastic cancers are treated more successfully with the X-rays and radium than by surgery whereas mature and highly differentiated tumors with a low degree of anaplasia respond better to surgery than to irradiation. The histological grading of malignancy therefore represents the basis for the clinician's decision as to the type of treatment indicated.

At present the grading of cancers is always a group grading and not a grading of the individual case. It places the tumor in a group of tumors in which, according to empirical observation, a certain percent age of cures is obtained. Since, with our present therapeutic measures, cure depends mainly on the absence of metastases, the histological grade of malignancy expresses also the tendency of the tumor to form metastases. All other factors being equal, a high degree of malignancy indicates a less favorable prognosis than a low degree of malignancy. Patients with high-grade malignancy should be examined especially carefully for distant metastases and re-examined frequently after operation or irradiation.

MANUEL K. LACHOWITZ, M.D.

Saunders, E. W.: A Bacteriological Study of Chronic Ulceration in Relation to Carcinoma. *Ann. Surg.* 93, 227-237.

The author reports a clinical, bacteriological, and serological study of forty-one identical strains of streptococci isolated by anaerobic tissue cultures from twenty-four resected ulcers of the stomach

(five of which were carcinomata) two ulcers from ulcerative colitis, two ulcers from carcinomata of the rectum, eight ulcers from carcinomata of the cervix uteri, and three ulcers from carcinomata of the breast. The strains proved identical morphologically and culturally with the streptococcus lactis which may be consistently isolated from cows' milk. This fact suggests a correlation between gastric and duodenal ulcer, ulcerative colitis, infectious granuloma and polyps of the intestine, chronic cervicitis, Hodgkin's disease, and carcinoma. The factor of chief importance in the correlation is microbial dissociation.

The specific agglutinins of the organism were found in the blood in all cases of gastric ulcer tested, whereas in cases of other types of streptococcus infection agglutination failed to occur or occurred only in low titer.

The diplococcus isolated by Barger from ulcerative colitis is identical. The same streptococcus was isolated from three carcinomata of the breast. In three cases of inoperable carcinoma of the breast a vaccine and filtrate of the organism made for skin sensitivity tests produced typical large wheals, whereas in six cases of breast abscess it caused no reaction.

NATHAN N. CROW, M.D.

Wilson, E. D., and Mahor, H. C.: Cancer and Tuberculosis. *Am. J. Cancer* 93, 271, 277.

The authors review pathological and epidemiological factors associating cancer and tuberculosis and present a detailed mathematical discussion of the expected as against the reported incidence. They believe that there is little or no evidence in favor of an antagonism or dissociation between the two diseases and in general only questionable evidence indicating a slight degree of positive association. They therefore conclude that cancer and tuberculosis may be regarded as independent conditions although they believe there is considerable evidence of an association between cancer of the esophagus and pulmonary tuberculosis.

NATHAN N. CROW, M.D.

#### GENERAL BACTERIAL, PROTOZOAN AND PARASITIC INFECTIONS

Glenn, H.: Personal Observations in 100 Cases of Severe Pyemia Following Angina (Die von uns bei der Beobachtung von mehr als 100 Fällen von schwerer Pyämie nach Angina gewonnenen Gesichtspunkte). *Zeits. f. Hals-, Nasen- u. Ohrenheilk.*, 93, 222, 404, 405.

In severe pyemia following angina vascular changes are found. A change in the adventitia or the vessel walls, if not a thrombosis, is present. There are always severe systemic symptoms. The face has a cyanotic-icteric color, the pulse is small, soft, and frequent, and the tongue is dry. Tender areas along a vessel is important, but is of less significance in the acute stage and when the glands are palpably enlarged. The diagnosis is based chiefly on the general symptoms, the condition of

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NOTE—THE BOLD FACE FIGURES IN BRACKETS AT THE RIGHT OF A REFERENCE INDICATE THE PAGE OF THE ISSUE ON WHICH AN ABSTRACT OF THE ARTICLE REFERRED TO MAY BE FOUND.

## SURGERY OF THE HEAD AND NECK

### Head

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# INTERNATIONAL ABSTRACT OF SURGERY

AUGUST, 1932

## ABSTRACTS OF CURRENT LITERATURE SURGERY OF THE HEAD AND NECK

### HEAD

Pichler, H Tumors of the Jaw, with Special Consideration of the Early Diagnosis (Kiefer-tumoren mit besonderer Berücksichtigung der Frühdiagnose) *Wien klin Wchenschr*, 1931, u, 1315

In the treatment of malignant tumors only surgery comes into serious consideration as radiation therapy is too uncertain and gives permanent results only exceptionally. Prophylactic postoperative radiation is not particularly successful in carcinoma of the lower jaw, but is of greater value in sarcoma.

As carcinoma of the jaw usually arises from the mucous membranes, and sometimes also from the external skin, it should be recognized early with careful observation. Most difficult at first glance is the differentiation of a malignant ulcer from a simple, traumatic inflammatory ulcer. Observation for several days after removal of the irritant (tooth, prosthesis) will show the nature of the ulcer.

Sarcoma of the jaw develops most frequently within the bone and leads to swelling of the jaw comparatively late. The most important symptoms are pain and loosening of the teeth. The presence of these symptoms without an apparent cause should suggest the possibility of malignant tumor. Roentgen examination is usually of no aid in the differential diagnosis of benign and malignant tumors.

Of the benign tumors, the adamantinoma and the so-called round-celled sarcoma (epulis) are of practical importance. The former are true neoplasms formed from the cells of the enamel organ and may be solid or show a tendency toward cyst formation. The latter are today characterized by pathologists as osteodystrophy fibrosa localisata and attributed to inflammation. After incomplete removal both tend to recur locally, but neither undergoes rapid malignant growth. They should therefore be removed completely, but not by destructive methods. Radium radiation combined with thorough excision gives good results.

DRUEGG (Z)

Welge, H Malignant and Benign Tumors of the Upper and Lower Jaw Operated upon at the Surgical Clinic of the University of Goettingen in the Period from 1919 to 1929 (Ueber die in den Jahren 1919 bis 1929 an der chirurgischen Universitäts-Klinik zu Goettingen operierten malignen und benignen Tumoren des Ober- und Unterkiefers) 1930 Goettingen, Dissertation

This is a detailed report on thirty-seven cases of tumors of the upper and lower jaw operated upon at the Goettingen Clinic. The entire material included eighty-four cases. Of these, forty-seven were operated upon elsewhere and treated only by irradiation at Goettingen. Of the tumors operated upon at Goettingen, twenty-two occurred in the upper jaw and fifteen in the lower jaw. Among these there were twelve carcinomata in the upper jaw and two in the lower jaw. The rest of the tumors were classified as follows: Upper jaw sarcoma in three cases, endothelioma in one case, adamantinoma in one case, and epulis in five cases. Lower jaw sarcoma in four cases, endothelioma in one case, adamantinoma in two cases, and epulis in six cases. The frequency of tumors in the upper and lower jaws noted at the Goettingen Clinic corresponds to the literature. The grouping according to age and sex was also typical. Carcinoma occurs most often in men of advanced age, while sarcoma occurs more often in women and with about equal frequency at all ages.

As to the etiology of the tumors, their point of origin, and metastasis no new facts were learned. Histologically, eleven of the carcinomata were of the squamous epithelial type, one was an alveolar carcinoma, one a solid type of carcinoma and one a matrix-celled carcinoma. In the sarcoma group there were three spindle-celled tumors, one giant-celled tumor, and one round-celled tumor. In addition, there were an osteosarcoma and a sarcoma without histological diagnosis. The clinical manifestations were of the usual type.

The prognosis seems to be dependent to a great degree on the histological structure and the stage

of development of the tumor. In its relation to the operative technique it has been improved by the use of local anesthesia. The danger from postoperative pneumonia has been markedly reduced since the introduction of local anesthesia.

In operations on carcinoma of the upper jaw the Weber Dieffenbach Incision is used. Deviation from the typical and usual procedure is frequently necessary. Of twelve cases in which total resection of the upper jaw was done, an atypical procedure was used in seven.

In cases of tumor of the lower jaw the operative procedure depends on the type and localization of the neoplasm more than in cases of tumor of the upper jaw. The attempt should be made to preserve the function of the jaw. Therefore the after treatment and early plastic surgery should receive particular attention. Upon these depends also the cosmetic result.

In the cases reviewed there were two postoperative deaths: one from carcinoma of the upper jaw and one from sarcoma of the lower jaw. In nine cases of carcinoma of the upper jaw, one of carcinoma of the lower jaw, and two of sarcoma of the upper jaw death resulted from recurrence. Sarcoma of the lower jaw recurred. One carcinoma of the upper jaw and one of the lower jaw remained cured after five years. Permanent results were obtained in one case of carcinoma of the upper jaw, one of sarcoma of the upper jaw, and two of sarcoma of the lower jaw. The epulis tumors, five of the upper jaw and six of the lower jaw are considered separately. When a thorough operation is done the prognosis is favorable.

A. STAFF (2)

Hobbs, W. H., Smolarew, H., and Frost, C. L. Acute and Chronic Infections of the Parotid Gland; Treatment by Dilatation of Stenson's Duct. *Surg. Gynec. & Obst.*, 93, Ev 555.

The authors believe that, for some cases, their method of treating infections of the parotid gland—dilatation of Stenson's duct through the mouth and irrigations with saline solution—constitutes a distinct advance over the methods employed heretofore. It is physiological because it drains the infection through a normal passageway; it differentiates the cases in which surgical intervention will be necessary; it requires no special instruments or unusual skill; it causes little discomfort, and it gives a reasonable assurance of success.

A number of cases in which the authors' method was used are reported. JOHN J. MALONEY, M.D.

#### ENT

Blatt, M.: The Correction of High Myopia by Moeller's Contact Glasses. *Arch. Ophthalm.*, 1932, 14, 299.

Following a review of the history of contact glasses the author discusses a series of thirty-eight selected cases in which the use of Moeller's contact glasses produced a quite remarkable improvement in visual acuity. The patients ranged in age from

ten to sixty-three years and were afflicted with high myopia, corneal scars, or both. A comprehensive table of case reports is included in the article. The author describes his technique in fitting the lens. SAMUEL A. DUNA, M.D.

Pelours, P. R.: The Ophthalmological Importance of Focal Infective Prostatitis. *Arch. Ophthalm.*, 1932, vii, 37.

In men over thirty-five years of age focal infection producing eye lesions is frequently of prostatic origin and rarely due to the gonococcus. Focal infection originating in the tonsils or teeth may persist in the prostate following removal of the original focus. In cases of secondary ocular involvement massage of the prostate must be carried out with the greatest care and not oftener than twice a week. If a reaction occurs in the eye following prostatic massage, the massage should not be repeated until three days after disappearance of the reaction. Ocular reactions are analogous to treatment with a vaccine and therefore indicate the frequency and energy with which prostatic massage may be carried out. SAMUEL A. DUNA, M.D.

Knobloch, R.: Luxation of the Lens (Glaucoma). *Cas. (N. Ser.)*, 93, 122, 364.

Of 150 cases of lenticular displacement, 93 were of traumatic origin. Three of the 93 were examples of completion of the dislocation of a congenitally subluxated lens; 50 were cases of subluxation; 20, luxations into the anterior chamber; and 23, luxations into the vitreous chamber. Of 35 luxations which were spontaneous, 14 were originally congenital subluxations. Twenty were into the anterior chamber and 3 were into the corpus vitreum, and 8 are subluxations. Twenty-six of the total number of 53 luxations were congenital subluxations. Of these, all were bilateral and occurred in highly myopic eyes. In 3 cases there was corneal opacity, but in 1 of these coloboma of the opticus was present. There were 4 cases of lenticular opacity which was total in 1 and partial in 3. Detachment of the retina was present in 1 case. In half of the 26 congenital cases the luxation was total. In 4 it was bilateral, and in 9 unilateral. In 3 cases the luxation became total following an injury. In 4 it was completed spontaneously. In 16 cases the luxation was into the anterior chamber and in 1 into the corpus vitreum.

Among the cases of acquired subluxation there were 36 of secondary glaucoma. In 9 cases extraction of the lens prevented this complication. Of the 26 cases of congenital subluxation secondary glaucoma developed bilaterally in 1 and unilaterally in 3. These were cases in which the luxation was not total. Secondary glaucoma developed in 34 of the 40 cases of luxation into the anterior chamber. In 5 of the 40 the lens had been removed prophylactically and glaucoma did not appear. In 1 case the lens was not removed, but secondary glaucoma did not develop. The patient had a very small lens. Of the 26 cases of luxation into the corpus vitreum

space between the tongue muscles, and the sub-mandibular spaces may be involved in severe cases and the process may extend to the parapharyngeal space and from there to the head or neck.

Phlegmon of the floor of the mouth occurs most frequently between the sixteenth and the thirtieth years of life. It begins with a slight swelling on the floor of the mouth on the side of the diseased tooth. The tongue is pushed back, and the swelling extends to the angle of the jaw and involves the surrounding soft parts. It is hard, red, and very sensitive to the touch. The symptoms include a high fever (from 38 to 40 degrees C), a rapid pulse, chills, cyanosis and sometimes sensory disturbances. Edema of the glottis and sepsis or pyæmia are to be feared.

The prognosis is very unfavorable. The mortality is usually about 20 per cent, but some surgeons report an even higher rate.

In the differential diagnosis, sublingual abscess, hæmatoma, peritonsillar abscess, lues, tuberculosis, and furuncle are to be considered.

In the initial stages it is sufficient to remove the offending tooth and apply hot applications. Treatment with roentgen radiation is recommended as it causes rapid abscess formation. Bacteriological study of the pus shows the streptococcus hæmolyticus and viridans and the staphylococcus aureus hæmolyticus. In advanced cases radical surgical methods must be used. In most cases the incision must be made externally at the angle of the jaw, but some surgeons prefer broad incisions in the floor of the mouth. The wound must then be drained and irrigated with antiseptics, and heat must be applied. With extensive exposure the process comes to a standstill and a cure gradually results.

In conclusion, the author reports two cases with a favorable outcome. GEBHARDT-BODENSTEIN (H)

### PHARYNX

Webster, R. Occult Tuberculosis of the Tonsil in Relation to Tuberculous Cervical Adenitis. *Med J Australia*, 1932, 1, 351.

The author states that of 86 children with tuberculous cervical glands, 40 (46.5 per cent) were found to have tuberculous lesions in the tonsils.

Of 46 pairs of tonsils removed for simple hypertrophy or other cause except tuberculosis of the cervical glands, none showed tuberculosis.

The author discusses the value of histological diagnosis and emphasizes that primary tuberculosis of the tonsil is seldom, if ever, apparent clinically. He concludes that tonsillectomy is clearly indicated in the treatment of tuberculous cervical adenitis.

JAMES C. BRASWELL, M.D.

### NECK

Menville, L. J. The Radiological Aspect of Thyrotoxicosis. *Radiology*, 1932, xviii, 568.

Although the mortality of thyroid surgery in a few large clinics in the United States is remarkably

low the general mortality rate is high and becoming higher as the number of surgeons who operate for thyrotoxicosis increases. Radiation therapy is free from mortality. In order to obtain statistics regarding the value of radiation therapy, Menville sent out a questionnaire to 200 radiologists. Reports were received from 75. The replies are tabulated.

Of a total of 10,541 patients treated by radiation 950 had been operated upon previously. The radiation was followed by cure in 66.22 per cent of the cases, marked improvement in 21.07 per cent, no improvement in 12.4 per cent, and recurrence in 8.45 per cent.

The author concludes from this statistical study that radiation therapy is safe and as effective as surgery. It is followed by recurrence less frequently than surgery and spares the patient the discomforts and expense of operation.

LEO M. ZIMMERMAN, M.D.

Quigley, D. T. The Radium Treatment of Toxic Types of Goiter. *Radiology*, 1932, xviii, 576.

In the period from 1916 to 1927 the author treated 137 cases of toxic goiter with radium. He reports favorable results in approximately 70 per cent of the cases. In cases of toxic adenoma the results were less satisfactory, subsequent operation being required in approximately 50 per cent.

LEO M. ZIMMERMAN, M.D.

Richter, H. M. The Surgical Treatment of Thyrotoxicosis. *Radiology*, 1932, xviii, 542.

Adequate surgical therapy of thyrotoxicosis consists in the removal of all but from 2 to 4 gm. of thyroid tissue.

Of 1,235 patients subjected to the radical operation for thyrotoxicosis, 1,096 were followed for from one to more than five years. Of the latter, 1,057 (96 per cent) were completely relieved, as evidenced by a normal basal metabolic rate. Of the remaining 39 patients, 23 consented to re-operation, and of the latter, 21 were cured. A successful result was therefore obtained ultimately in 98.4 per cent. The mortality in the 1,235 cases was 0.89 per cent. This compares favorably with the mortality of X-ray treatment when the higher late mortality of the latter is considered.

LEO M. ZIMMERMAN, M.D.

Schmidt, H. Methods of Inducing Anaesthesia for, and the Mortality of, Operation for Basedow's Disease (Anaesthesiemethode und Mortalität bei Basedow-Operationen). *Arch f klin Chir*, 1931, clxvii, 107.

In Basedow's disease the psychic excitation, the thyrotoxic injury of the viscera, and the strain placed upon the circulation by the increase in the circulating blood must be considered. The indication for the diminution of pain is based upon these conditions. During the past eight years the Hamburg clinic has given up local anesthesia, which they had used previously for many years, because of the conviction that the psychic trauma of an operation performed

under local anesthesia is a greater strain upon the agitated patient than a carefully conducted narcosis. Since 1915, 80 per cent of the operations for Basedow's disease have been done under gas anesthesia. The anesthetic preferred is nitrous oxide, which is odorless and free from the danger of explosion. Gas anesthesia combines a strong psychic protective action with a possible very slight somatic harm. Great care must be taken to prevent injuries of the viscera (liver, pancreas, and kidneys) in Basedow's disease. Avertin is used in only a small, well-chosen group of cases.

In 248 cases operated upon in the past five years there were 12 deaths, a mortality of 4.8 per cent. The statistics for the private clinic were considerably better the mortality being only 2.6 per cent. Statistics for 1931 based on 250 operations showed 16 deaths, a mortality of 5.3 per cent. A distinction is made between deaths due to the operation, typical Basedow deaths resulting from excitation, deaths due to thyrotoxic myocarditis, those due to degenerative changes occurring in the liver, kidneys, and pancreas, and those due to accident and failure of the operation.

Because of the rule of the clinic not to reject any operative cases, there will always be a certain number of specific deaths which neither iodine nor anesthesia will change to any extent. Therefore the view that operation for Basedow's disease has been freed from all danger cannot be accepted. In the cases of all except 1 of the patients who died, a 1-stage, bilateral subtotal resection was performed. The so-called postoperative reaction is usually already quite definite at the time of the operation. It is the result of psychic shock and not the consequence of an increase or decrease of the endocrine secretions in the blood.

EL. SARGENT (2)

Williams, A. H.: X Ray Treatment in Goiter Illness, with Results Reported and Comments Made on 299 Individually Controlled Cases. *Radiology* 1931, xviii, 555.

There is a great divergence of opinion regarding all phases of hyperthyroidism. Although the exact cause of hyperthyroidism is unknown, the condition is probably the result of excessive or altered secretion of the thyroid cells. Treatment inhibiting or destroying the cells is curative. Surgery and irradiation exert such an effect.

The author reports the results of X-ray treatment in 200 cases of thyroid conditions including hyperthyroidism, toxic goiter and exophthalmic goiter. An average of 50 treatments was given in three and a half months. One hundred and sixty-one (80.5 per cent) of the patients were definitely cured and 37 (18.5 per cent) benefited. Eight recurrences developed after a year.

LEO M. ZIMMERMAN, M.D.

Tucker G.: Early Intrinsic Cancer of the Larynx. Diagnosis and Treatment. Observations on Laryngofissure as a Method of Treatment in a Series of Cases. *Ann. Otol., Rhinol. & Laryngol.* 1931 xli, 36.

The author urges that in cases of laryngeal lesions direct laryngoscopy and biopsy be performed as early as possible in addition to the routine and mirror examinations. He reports the results of laryngofissure in thirty cases of early intrinsic cancer of the larynx and describes the technique of the procedure. He states that anterior intrinsic cancer of the larynx is amenable to cure by laryngofissure and the latter procedure will save the larynx as well as the patient's life. A large percentage of cancers of the larynx are of the anterior intrinsic type.

NATHAN N. CHANIN, M.D.

# SURGERY OF THE NERVOUS SYSTEM

## BRAIN AND ITS COVERINGS, CRANIAL NERVES

Wortis, S. B., Stevenson, L. D., Friedman, E. D., and Kennedy, F. Head Injuries, Effects and Their Appraisal I Experimental Studies of Induced Convulsions and Ventricular Distortion in the Cat II The Role of the Microglia III Encephalographic Observations IV Evaluation of Evidence *Arch. Neurol. & Psychiat.*, 1932, *xxvii*, 776, 784, 791, 811

WORTIS, in reviewing the literature on the effects of head injuries, cites experiments carried out on rabbits by Brown-Sequard in 1851 in which various parts of the central nervous system were traumatized. Convulsions were induced by lesions of the medulla, cord, peduncles and quadrigeminal bodies. Contralateral convulsions followed cerebral lesions. In 1925 Dandy and Elman concluded that injury to the motor cortex causes greater sensitization to motor convulsive phenomena than lesions of other cortical areas. Recent work has shown that the formation of a cerebral cicatrix and ventricular distortions are related to posttraumatic phenomena and has resulted in a method of surgical treatment for traumatic epilepsy.

In the experimental work reported by Wortis the brains of cats were traumatized by laceration after trephination and by fracturing the skull over the left frontoparietal region. Convulsions were produced at intervals after the injury by increasing quantities of a standardized solution of camphor monobromide injected into the femoral vein.

Pathological examination showed three types of gross cerebral lesion:

1. Meningocerebral adhesions, which evidently varied with the amount of injured cerebral tissue left behind.

2. A contracting cerebral cicatrix with an overgrowth of microglia cells early and fibroblasts and collagen fibers later.

3. Ventricular distortions: the entire ventricular system being pulled toward the side of the lesion. This distortion was frequently accompanied by a dilatation of the entire system and especially the first, second and third ventricles, which was more marked on the side of the lesion than on the other side. In the ventricular shift produced by external foreign bodies the ventricle on the side of the lesion was slightly collapsed and pushed toward the opposite side and the contralateral ventricle was usually dilated.

Head trauma resulting in the escape of blood into the cerebrospinal fluid often gave rise to mild bilateral ventricular dilatation in the absence of grossly demonstrable meningocerebral adhesions or a cerebral scar. Aseptic laceration of the brain and head

trauma resulting in fracture of the skull increased the animal's sensitiveness to a standard convulsant over the period of observation.

STEVENSON, in discussing the role of microglia, states that after injury to the brain the microglia cells undergo a change that is the reverse of the changes which occur during their development. The characteristic long, thin processes become swollen and shorter and the cell body becomes larger and rounder. The cells become actively motile and phagocytic and move to the site of injury, multiplying on the way by mitosis. They devour the broken down brain tissue, become loaded with fatty substances, and move to the blood vessels of the contiguous areas. They can be demonstrated as fat granular corpuscles with any fat stain. The process of devouring brain tissue may be more extensive than is necessary. The ventricle on the injured side may be pulled over by adhesions and contractions of the scar, but it seems also that this loss of substance, represented by the increase in the size of the ventricle is due to the phagocytic action of the microglia.

From the pathological specimens studied it seems that injury to the brain is likely to be more extensive than is at first apparent. The development of symptoms after injury often attributed to neurosis or a desire for compensation, may well be the result of the phagocytic action of the microglia cells with the resulting changes. A roentgen examination of the skull and encephalograms are indicated before such symptoms are attributed to a neurosis. The suggestion is made that it might be better to operate in more cases of brain injury, removing damaged brain tissue and thereby diminishing the phagocytic and scarring processes.

FRIEDMAN records encephalographic observations in sixteen cases of head injury and includes encephalograms in his report. In all but one case the encephalograms showed definite changes consisting of dilatation of the ventricles, accumulations of air on the convexity of the brain, and migration of the ventricular system toward the side of the lesion. These abnormal findings suggest an organic basis for some of the symptoms of the posttraumatic state.

In cases of skull injury there may be all grades of hemorrhage from punctate bleedings up to gross extravasations.

The symptoms of the posttraumatic state may be general or focal. The symptoms of the general syndrome are more or less identical with those observed in arteriosclerosis of the cerebral vessels. Vestibular tests of injured persons often show increased irritability of the labyrinths with pronounced reactions to caloric tests, indicating a lowered threshold for all stimuli.



There is no essential difference between encephalograms in cases of skull injury and those in degenerative disease of the brain or in idiopathic epilepsy of some duration, which is now believed to be of angioneurotic origin.

Normally the upper outer pole of the anterior horn of the lateral ventricle is sharply pointed. This configuration is retained even in the presence of a brain tumor. The first objective evidence of internal hydrocephalus consists of a blunting and rounding out of the upper outer pole of the lateral ventricle, whether the hydrocephalus is of obstructive origin or the result of scarring.

KENNEDY in discussing the evaluation of evidence, states that scarring produces brain deformity but such deformity does not necessarily cause abnormal function. Complete symmetry of the ventricles cannot be postulated as constant before injury. Variations in the technique of encephalography result in abnormal pictures. A uniform technique must be employed and previous brain injury excluded before any conclusion is reached. If distortion is discovered the examiner must decide whether it is sufficient to produce the symptoms. The symptoms are often vague and generalized. Clinical judgment based upon a consideration of all factors cannot be replaced entirely by encephalography.

The histopathological work of Foerster and Penfield, the experimental work of Bagley, Worts, and Dandy and the varied results of gunshot wounds and skull fractures indicate that the minimal requirements for immediate or subsequent convulsions is laceration and scarring of the brain or the presence of blood in the subarachnoid space. The type of fit varies with the part of the brain affected. Petit mal is a change in consciousness due to a frontal disorder and is rare after injury. Complex visual, auditory and psychic hallucinations result from lesions in the temporoparietal lobes, and gross color fits from a disorder in the occipital poles. The great fit is due to involvement of the entire cortex. Narcolepsy and catalepsy have not been observed following head injury but psychic equivalents are not uncommon. Subjective symptoms—the postconcussion syndrome or posttraumatic general cerebral syndrome—are not easy to appreciate correctly. The usual complaints are headache which is rarely localized, and dizziness, especially on stooping. These are often made worse by small amounts of sedatives and by constipation, and can sometimes be relieved by small amounts of sedatives.

A severe injury followed immediately by manifestations which persist and the later discovery of ventricular distortion are signs of localized meningitic change sufficient to produce residual symptoms.

Few patients with head injuries including skull fractures, return with any complaint. Suggestion plays a major part in mental life, and fear can be increased by a gloomy medical prognosis, an acquiescent legal opinion, or a solicitous relative.

The criteria of head injury sufficient to produce organic change are

1 Absolute criteria (a) roentgen evidence of skull fracture (b) bloody spinal fluid, (c) bleeding from orifices, especially the ears and (d) focal cerebral palsies.

2 Presumptive criteria (in order of importance) (a) convulsive states proved to be posttraumatic (b) ventricular distortion proved to be posttraumatic (c) a history of prolonged unconsciousness and (d) a history of adequate trauma, especially with vomiting following the injury.

All but 2a and 2b can be determined with accuracy. Convulsive states not readily apparent may be provoked by cocaine or hyperventilation. Head ache and dizziness are most difficult to evaluate. If they persist for more than four months in a man under sixty years of age in the absence of the first seven criteria of brain injury mentioned they are to be regarded as suggested neuroses not founded on structural change.

In the discussion of this report, FINKFIELD (Moscow) states that true posttraumatic headache is described as being always in the same place. It is usually worse at some particular time in the day and is accompanied by a characteristic type of dizziness which comes on any time and lasts for from one to ten minutes. If walking, the patient is obliged to stop and wait. The headache is sometimes described as a darkness, and may seem to the patient to be visual. In some cases it can be completely abolished by the spinal infusion of air.

In encephalography the best plate is obtained by the patient on his back with the brow up. One plate should be taken at the beginning and another at the end of the procedure. One plate shows the anterior horns spread out wide, and the other the typical butterfly shape of the body. If oxygen is used instead of air there is less headache following the injection and the gas is absorbed more quickly.

L. B. PLATT, M.D.

Kiddoch G., Jefferson, C. Russell R., Ross, J. P. and Others. Discussion on the Diagnosis and Treatment of Acute Head Injuries. *Proc Roy Soc. Med. Lond.* 1932, XXV 735.

Rimpoist stated that the effects of acute head injuries are due to cerebral concussion and contusion. The latter which is far the more frequent, may or may not be accompanied by laceration.

According to Trotter concussion is a condition of widespread paralysis of the functions of the brain which comes on as the immediate consequence of a blow on the head, has a strong tendency toward spontaneous recovery and is not necessarily associated with any gross organic change in the brain structure.

The recognition of concussion is not difficult except in the acute stage when complications such as contusion, laceration, and hemorrhage are present. Damage to the brain or the occurrence of extra cerebral hemorrhage is evident if recovery of consciousness is delayed, if the stage of reaction is delayed more than a day or so if stupor or coma

fibrillary contractions and trophic disturbances disappeared. Oppel reported six cases in which the results varied, but the time of observation after the operation in these cases ranged only from two to seven weeks. Foerster reported a case which he followed for two years after operation. Guleke, in 1929, and Elmer, in 1930, each reported a case in which the condition remained stationary five months after the operation. Juzelewski gave a short résumé of fifteen cases in which he had operated. Heymann reported a surgically treated case in 1930. Putnam reported two cases, Peiper (1931) four, and Frazier, Kappis, and Cooper one each.

In an appreciable number of cases—those of Poussep and Sicard and one each reported by Oppel, Foerster, and Peiper—the patients were greatly benefited. More frequently, the improvement was less marked or only partial. Often it was noted within a few days and then increased slowly. The return of muscular strength has often been reported. This was generally late and very gradual. It was frequently noted in the upper limbs. The spasmodic paresis of the lower limbs and associated functional impotence were sometimes favorably influenced and the pyramidal signs were lessened. The fibrillary contractions in the atrophied muscles seemed to disappear without any change in the amyotrophy.

Disturbances of sensibility were influenced by the operation more quickly and perhaps more frequently than the motility disturbances. Trophic disturbances were much improved. In some cases sphincter disturbances disappeared after the operation, but the Claude Bernard-Horner syndrome was not modified.

In some cases the symptoms showed no change, in others, some of the disturbances were decreased and others were aggravated, and in still others, new troubles appeared. In some patients the entire condition seemed worse after the operation.

The majority of neurological surgeons determine the level of operation from the clinical signs. Syringomyelia generally occurs in the cervicodorsal region. Therefore it is usually at this level that the operation is performed. Endomyelography gives information as to the site of the medullary cavity. Roentgenography with the use of lipiodol will reveal the maximum lesion if the cord is sufficiently increased in size. The Queckenstedt-Stookey test may show a partial blocking and the approximate site of the most dilated part of the cavity.

In most cases the posterior route has been used. Frazier states that the incision should be made where there is least danger of injuring healthy medullary tissue. The lateral route has also been employed. To assure permanent drainage between the intramedullary cavity and the subarachnoid space, Oppel inserts a fragment of dura mater between the lips of the wound, Kirschner uses a fragment of muscle, and Frazier employs gutta percha.

Whatever their mechanism, the symptoms due to sensory and motor incoordination, although they are not very frequent and often improve, constitute

the most troublesome complication of the operation.

It is probable that in the majority of cases there is hypertension of the spinal fluid. However, this is not constant. The hypertension probably acts through the mechanical disturbances it causes. However, in Sicard's case, in which hypertension was absent, the condition was improved, and observations in other cases also indicate that the drainage acts not only by equalizing the pressure on the external and internal walls of the syringomyelia cavities but also in other ways of which we are still ignorant.

Schaeffer is of the opinion that every case of syringomyelia should be treated first and as early as possible by irradiation. If, after a few months, considerable improvement has not been obtained and roentgenograms made with lipiodol show a partial blocking, operation may be performed. Operation sometimes proves beneficial even when the symptoms have been present for several years, but in some cases will cause no improvement.

PAGE

#### PERIPHERAL NERVES

Pollock, L. J., and Davis, L. *Peripheral Nerve Injuries*. Fourth Installment. *Am J Surg*, 1932, 77, 139.

In the fourth installment of their monograph on peripheral nerve injuries the authors consider first the pathology of such lesions. In the interpretation of the pathological picture presented by a peripheral nerve lesion they consider it necessary to take into account not only the associated lesions in the soft tissues, bones, tendons, and blood vessels, and the presence or absence of infection, but also changes that may ultimately result from the nerve injury, such as atrophy of muscles, fibrotic changes in joints, and trophic disturbances of the skin.

The pathological changes in the peripheral nerves following various types of injury are described in detail. The morbid changes in the surrounding structures due to the injury and the changes in the tissues due to the lesion of the nerve are considered. The latter are described in detail and the mechanisms operating in their development are discussed. The authors consider also the pathology of the neoplastic lesions peculiar to peripheral nerves.

The literature on the histopathology of nerve degeneration and regeneration is reviewed. One chapter is devoted to the histological changes observed in these processes. The authors consider the surgical treatment of injuries to the peripheral nerves dependent entirely upon a clear understanding of the histopathological changes produced in the neuromuscular system by the complete anatomical or physiological separation of a nerve fiber from its cell of origin.

A very complete discussion of the indications for surgical treatment in injuries of the peripheral nerves is given. The authors emphasize the im-

There is no essential difference between encephalograms in cases of skull injury and those in degenerative disease of the brain or in idiopathic epilepsy of some duration, which is now believed to be of angiospastic origin.

Normally the upper outer pole of the anterior horn of the lateral ventricle is sharply pointed. This configuration is retained even in the presence of a brain tumor. The first objective evidence of internal hydrocephalus consists of a blunting and rounding out of the upper outer pole of the lateral ventricle, whether the hydrocephalus is of obstructive origin or the result of scarring.

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L. S. PRATT, M.D.

**Riddoch, G., Jefferson, G., Russell, R., Ross, J. F., and Others.** Discussion on the Diagnosis and Treatment of Acute Head Injuries. *Proc. Roy. Soc. Med. Lond.* 93 xiv 715.

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# SURGERY OF THE CHEST

## CHEST WALL AND BREAST

Adair, F. E. The Treatment of Metastatic and Inoperable Mammary Cancer, with a Discussion of Certain Distinct Types of Metastasis  
*Am J Roentgenol*, 1932, xxvii, 517

Adair attempts to evaluate the various methods of treating primarily inoperable, recurrent inoperable, and metastatic carcinomata of the breast.

Metastases to the axilla are extremely important from the standpoint of cure. Their treatment with radium is difficult because (1) radiosensitivity depends upon the blood supply of the tumor bed and the axilla is filled with fat which has a poor blood supply, (2) the axilla contains unusually large vessels, and (3) the site to be irradiated is close to the brachial plexus.

In cases with axillary involvement Adair has been using bare tubes and gold seeds of radium in the axilla at the time of operation. A row of seeds 1 cm apart is placed along the axillary vein, beginning near the sternoclavicular junction and no closer than 5 cm to the vein. Another row is introduced across the axilla superficially in the intercostal muscle. These act as barriers against upward extension into the supraclavicular space.

It is difficult to introduce radon seeds into the axilla without opening it. With the use of anesthesia and with the arm held at exactly a right angle, an assistant presses the axillary vein upward as it crosses the arm. Through a small incision in the midaxillary line the radon seeds may then be introduced into the axilla in a fairly accurate manner with little danger of injuring the axillary vein, thus being held out of the way by the assistant's finger.

Adair is of the opinion that the axilla will not withstand a 10 to 12 skin-erythema dose received by the breast. He always supplements interstitial irradiation with high-voltage X-ray irradiation. By using 5 portals, as suggested by Duffy, for the X-ray treatment and giving interstitial irradiation also it is possible to diffuse a 600 to 700 per cent skin-erythema dose in the axilla without causing serious damage to the brachial plexus. The author prefers small radium seeds to radium emanation because the latter is much more apt to produce an intractable neuritis.

There are 3 types of supraclavicular metastases. The most common is a single node located in the lateral portion of the supraclavicular space which progresses very slowly. As the clavicle has almost no covering of fat between it and the skin, it is poorly protected against irradiation. However, the author has never seen injury of the clavicle in cases in which a high-voltage roentgen-ray cycle was given before operation, another a month after opera-

tion, a third at the end of three months and a fourth from four to five months later. Another type of supraclavicular involvement consists of direct extension of the axillary disease up to the tip of the mastoid. This is frequently associated with symptoms of posterior auricular neuralgia due to pressure on the postauricular nerves and invariably occurs in cases of rapidly growing carcinoma. External irradiation is of value for relief of the pain, but because of the highly malignant character of the condition it cannot effect a cure. The third type of supraclavicular metastasis, which is uncommon, consists of involvement of several large discrete nodes. As a rule these may be treated successfully by external irradiation and by interstitial irradiation with radon seeds.

Among the approximately 550 cases of cancer of the breast which are seen each year in the breast clinic of the Memorial Hospital, New York, there are from 2 to 4 with carcinomatous invasion of the brachial plexus. These present a rather typical clinical picture which is characterized by intense pain, atrophy of the hand and arm, increasing paralysis of the hand muscles, a dusky discoloration of the hand and elevation of the affected shoulder. Frequently there is also marked atrophy of the thumb and interosseous muscles. These cases are therapeutic problems because of the danger of producing neuritis if irradiation is used. In several instances chordotomy has been performed with successful results.

Parasternal metastases occur not infrequently, but are easily controlled by proper irradiation. Surgical removal is out of the question. In 6 of 10 cases the local lesion was cured by 1 radium pack of 1,500 mc-hrs followed by 1 high-voltage roentgen treatment. In the 4 other cases it was necessary to repeat the dose.

The treatment of osseous metastases is not so hopeless as was formerly thought. Adair believes that a great deal can be accomplished by careful irradiation, skeletal support, and the administration of drugs such as ergosterol, cod liver oil, and calcium lactate.

Metastases to the spine are of 2 types, those in which numerous foci are scattered throughout the vertebral column, and those in which a single metastasis occurs in 1 vertebra. Of importance especially in the latter group is support of the spine by a splint.

Adair believes that the pelvis is the second most frequent site of metastasis. Metastasis to the pelvis in the region of the hip joint produces symptoms ranging from vague discomfort in the joint to radiating pains in the thighs. The metastases are of 2 types, those of one type consisting of solitary,

portance of early diagnosis of the severity of the lesion. The difficulty at times encountered in differentiating a complete loss of function due to an anatomical interruption from loss of function due to a physiological interruption of nerve fibers is considered. In the presence of a complete nerve interruption without evidence as to whether or not anatomical severance has occurred it is the authors' practice to wait for from three to five months, depending on the nerve involved, for evidences of recovery before treating the injury as an anatomical section. During this time the muscles are kept in good condition by physiotherapeutic methods and repeated careful examinations are made for signs of regeneration. When there are definite evidences of anatomical severance, repair should be done immediately. Practically the authors believe that the same principles apply to partial lesions. They emphasize, however, that partial lesions must be studied especially carefully as attempts at their surgical repair may be followed by more loss of function than was present originally.

An aseptic field is considered absolutely essential for a successful result in nerve repair. In primary wounds of a clean type, primary suture may be done with fair chances of a good result. If infection occurs, the ends are in apposition so that at a later date a secondary resection and suture may be done if necessary. For the cases of patients presenting themselves with healed wounds which have been previously infected, the authors advise delaying the secondary suture until the dangers of recrudescence of the infection are minimal.

The authors next discuss the methods of peripheral nerve repair which have been suggested to date. They consider them all alternative to direct end-to-end suture of the nerve ends. However they review the results reported from the use of each. The method of first choice in clinical practice is end-to-end suture. The procedures giving the next best results are nerve crossing and nerve transplantation. Nerve flaps, nerve implantation, tubular sutures, and sutures at a distance should be abandoned as their clinical results are poor. HALL HAYES, M.D.

bronchial artery. The bronchial artery to a lobe ramifies widely and has numerous anastomosing branches. The pulmonary artery to a lobe branches into end-arteries which have only capillary communications. Normally, no blood from either system enters the other.

Under abnormal conditions certain changes occur in the two systems. In pneumonia the bronchial artery to the involved lobe becomes dilated and because of thrombosis or occlusion by pressure from the surrounding edema the pulmonary artery fails to fill completely in the precapillary area. The lymphatics to the affected lobe are dilated and filled with blood-tinged fluid.

In the presence of sterile atelectasis the bronchial and pulmonary arteries are normal. If pneumonia develops in the atelectatic lobe dilatation of the bronchial artery occurs and there is incomplete filling of the pulmonary artery in its precapillary bed.

When a branch of the pulmonary artery becomes occluded by an embolus a marked dilatation of the bronchial artery to that lobe results and the pulmonary artery in the embolic region eventually is fully supplied with blood, usually by way of the bronchial artery but occasionally by dilatation of capillary anastomoses with the pulmonary artery adjoining the embolic region. Accordingly, there is little macroscopic change if the embolus is sterile. If the embolus is infected, the pulmonary parenchyma undergoes changes ranging from localized pneumonitis and hæmorrhagic infarction to abscess formation and hæmorrhagic consolidation. Marked dilatation of the bronchial artery occurs and is undoubtedly an important factor in the repair of the diseased tissue.

Following ligation of the pulmonary artery to a lobe the bronchial artery becomes markedly dilated and the pulmonary artery beyond the embolus is filled through the dilated bronchial artery.

It may be concluded that, following small or large pulmonary emboli, the bronchial artery serves an important function by filling both circulatory beds beyond the embolus with blood. In case of infection, it provides increased nutrition to the affected lung as the result of its dilatation. EARL O. LATIMER, M.D.

Eloesser, L. Bronchial Stenosis. *J. Thoracic Surg.*, 1931, 1, 194, 1932, 1, 270, 373.

Bronchial stenosis may be congenital or acquired and either form may be due to pressure from without or narrowing within. Congenital variations in the bronchi are probably not infrequent. The effects of acquired strictures vary according to the level and degree of the obstruction.

Tracheobronchial stenosis and stenosis of the larger bronchi occur as the result of external pressure and intrinsic processes. Schrotter divides their causes into extramural (compression), mural (tumors, inflammatory strictures), and intramural (foreign bodies).

Among the causes of compression stenosis are enlargement of the mediastinal viscera of various kinds,

deep goiters, mediastinal tumors, carcinoma of the œsophagus and remnants of the thymus, osteomata and chondromata of the vertebral column and sternum, metastatic tumors, dermoid and echinococcus cysts, dilatations of adjacent mediastinal viscera, the heart, the large blood vessels, and the œsophagus, inflammatory processes and their scars, lymphadenitis, mediastinitis, and mediastinal pleurisy.

Goitrous compression occurs comparatively often in the young. Cancerous goiters cause the most marked stenosis. Their presence is revealed by dullness and the X-ray findings. Lymphosarcomata of the mediastinum, thymomata and Hodgkin's tumors usually compress the trachea and bronchiate in their course. Dilatation of the heart, aorta or œsophagus is a common cause of extrabronchial pressure. Extrinsic inflammatory causes are frequent because the products of all inflammations in the chest collect in the mediastinum, producing lymphadenitis and mediastinitis.

Intrinsic stenosis is caused by foreign bodies, tumors growing into the tracheobronchial lumen, the constriction of intramural inflammation and its scars, and softening of unknown origin.

Among the most common intrabronchial causes of bronchial obstruction are tumors of the bronchi, especially carcinomata. Apparently not infrequent causes are chondro-osteoplastic tracheopathy and cysts and diverticula of the tracheal wall. Inflammatory stenosis may result from syphilitic scars, tuberculous sclerosis, leprosy, glanders, and typhoid. Constriction of the bronchioles and obstruction of their lumina by swelling and destruction of the mucosa follow the inhalation of destructive fumes and gases.

Obstruction of the air passages was studied experimentally by Traube (1846-1871), and Lichtheim (1878). The findings of these investigators have constituted the basis of the majority of recent studies. The results of most artificial obstructions of the trachea in animals agree with the findings in clinical cases of tracheal obstruction. Partial stenosis of considerable degree causes at first inspiratory dyspnoea or stridor in which inspiration is prolonged, deeper, and more forceful. The intercostal spaces are retracted and the intrapleural pressure is lowered. If the stenosis is excessive this stage soon goes over into one in which breathing is rapid and shallow, the lungs are dilated, the intrapleural pressure approaches zero, and death is likely to supervene. The origin and immediate cause of inspiratory dyspnoea are difficult to determine, but the condition is probably the result of a nervous rather than a chemical mechanism.

If the constriction is such that not only inspiration but also expiration requires effort, a notable change occurs. Because of the deficiency of the expiratory mechanism an increasing amount of air is trapped in the lung behind the obstruction and acute dilatation of the lung, decompensation of the respiratory and circulatory mechanisms, and peripheral stasis result. To restore equilibrium the intra-

irregular destructive lesions and those of the other type being multiple. Adair believes that when a patient with carcinoma of the breast complains of symptoms suggestive of metastasis to the spine or pelvis, external irradiation should be given over the suspected area even if roentgenograms fail to reveal the lesion.

ALTON OGDEN, M.D.

Lee, B. J.: Interstitial Irradiation of Mammary Cancer with Special Reference to Measured Tissue Dose. *Am J Roentgenol*, 1933, xxvii, 547.

The author reports a study made in forty-one cases of cancer of the breast which were treated with measured doses of interstitial gold radon seeds either alone or in combination with some form of external irradiation. In thirty the neoplasm was of the primarily operable type and in eleven it was inoperable.

The object of the study was to ascertain the minimum dose necessary to devitalize mammary cancer completely, to determine whether or not this technique would be an advantageous routine measure, and to discover the limitations of, and contraindications to the method.

Eight patients with primarily inoperable lesions and four with inoperable lesions were treated by interstitial irradiation alone, and the remaining twenty-nine by a combination of interstitial and external irradiation.

It is considered best to use the external irradiation before the interstitial treatment. A careful analysis of twenty-two cases revealed no distinguishable difference whether the external irradiation was given with the X-rays alone or combined with the radium pack. The X-ray treatment requires eight days and the pack treatment ten days. The interstitial radon was implanted ten days after the external treatment had been completed. The author describes the preparation, introduction, and distribution of the implants in the tumor. The incidence of faulty implantation was surprisingly low. It is thought that the small amount of oozing which attended the implantation may result in dissemination and rapid metastasis of the disease, but no evidence of such an effect has been observed to date.

It is difficult to irradiate the entire axilla properly. In the cases reviewed the axillary dosage varied from 16 to 29 mc. and averaged from 24 to 25 mc. In ten cases operation furnished pathological material for a study of this phase of the disease. The author believes that implantation in the axilla is probably ineffective. In one case a severe neuritis of the brachial plexus developed following the use of seven implants carrying a total of 8 mc., and in spite of operative and other measures, has persisted over a period of nine months.

As the radiosensitivity of carcinomas of the breast varies widely it is thought best to use the dosage which will cure for the most radioresistant type and to restrict seed implantation to tumors no larger than 6 cm. in diameter. In general it has been found

that a 1,500 per cent skin-erythema dose is sufficient to destroy the most radioresistant tumors from 3 to 6 cm. in diameter.

Interstitial irradiation should never be employed when infection is present in the tumor. When radical surgery is preceded by interstitial irradiation, healing of the wound is delayed in at least 50 per cent of the cases because of extensive interstitial irradiation undue wound tension, or performance of the operation too soon after irradiation. It is believed that six weeks should elapse between the interstitial irradiation and the operation. In cases of tumors 6 cm. or less in diameter in which a 1,500 per cent skin-erythema dose is employed without wound tension operation performed after an interval of six weeks should be followed by primary wound healing.

Of the patients with primarily operable tumors who were treated by the method described, 85 per cent are free from the disease one and a half years after the treatment. The number of those who were treated by irradiation alone is too small to warrant conclusions, but 50 per cent of them are free from evidence of the disease. Of the patients with primarily inoperable lesions, three are living with inactive lesions, two are living with active lesions, and six are dead.

Studies of the type reported are more valuable since the introduction of aspiration biopsy by the technique of Martin and Ellis and of biopsy with the Hoffman punch.

Interstitial irradiation is associated with no danger from pulmonary fibrosis. However, because of the discomfort of the patient, the postponement of operation, and the added expense associated with its use it cannot be recommended as a routine pre-operative procedure. In general, the technique described is proposed as a substitute for radical surgery alone or combined with irradiation. It is recommended for cases in which operation is contraindicated, and is entirely justifiable in primarily operable cancer of the breast.

A. JAMES LARKIN, M.D.

## TRACHEA, LUNGS, AND PLEURA

Mathes, M. E., Holman, E., and Reichert, F. L.: A Study of the Bronchial, Pulmonary and Lymphatic Circulations of the Lung under Various Pathological Conditions Experimentally Produced. *J Thoracic Surg*, 1934, 4, 159.

In the study reported, which was carried out on the lungs of dogs, the vessels of the lung were injected with Hull's mass. The bronchial artery was injected first and the pulmonary artery later. The pressure maintained during the injection was equivalent to that for the same vessel during life. In many of the specimens the pleural lymphatic vessels were injected with India ink or mercury.

The findings indicated that the bronchial artery supplies nutritional blood at systemic pressure. The pulmonary artery supplies blood for oxygenation at a pressure approximately one-third of that in the

Unilateral stenosis may be recognized from unilateral impairment of the respiratory excursions, retraction of the intercostal spaces, dullness or flatness, and absence or weakness of breath sounds. It is distinguished from pleural fluid by retraction of the mediastinal viscera toward the affected side.

Complete stenosis involving one of the lobar bronchi is characterized by shrinkage of the lobe with retraction of the chest wall and viscera toward it. The diagnosis is confirmed by bronchoscopic and X-ray examination.

A distinction between tuberculous and tumor stenosis is of great practical importance. The bronchoscopic and physical findings usually reveal the cause. In cases of aneurism and cases of cysts, dermoids, carcinomata, and other intrathoracic growths many of the physical findings may suggest bronchial stenosis, but mediastinal retraction is absent and bronchial stenosis may be ruled out by bronchoscopic examination and the use of lipiodol.

WILLIAM J. TANNENBAUM, M.D.

Kjaergaard, H. Spontaneous Pneumothorax in the Apparently Healthy. *Acta med Scand*, 1932, Supp. xiii.

From time to time a person who is feeling perfectly well and has a history of good health suddenly develops spontaneous pneumothorax. The illness runs a benign and afebrile course without forming an exudate and terminates in spontaneous recovery. Of forty-nine persons re-examined from two to eighteen years after the spontaneous pneumothorax, only one had developed pulmonary tuberculosis.

Kjaergaard concludes that spontaneous pneumothorax in the apparently healthy constitutes a distinct entity. For the sake of brevity he suggests calling it "pneumothorax simplex." This term he applies to all cases of pneumothorax developing without demonstrable cause in persons in whom no sign of tuberculosis may be demonstrated by auscultation or X-ray examination of the chest or by bacteriological examination of the sputum and the condition runs an afebrile course without pleural effusion, similar cases in which there is a slight rise in the temperature in the first week of the illness, and cases in which roentgenograms show the presence of pleural exudate in an amount too small to be discovered by auscultation.

The condition is due to rupture of a valve vesicle on the surface of the lung. There are two forms of valve vesicles. Those of one form, the scar-tissue vesicles, develop especially in the apices of the lungs next to a scar that may originate in a small healed tuberculous process. Scar-tissue vesicles are often multiple. The vesicles of the other form are the emphysematous valve vesicles which are produced only by local emphysematous changes without scar tissue. They may be found as large solitary vesicles on the margins of the lungs. It is probable that the scar-tissue vesicles are the more common.

Systematic after-examinations of a large number of patients over a long period of time have shown

that in practice it may be taken for granted that pneumothorax simplex has nothing to do with active tuberculosis. Therefore persons developing the condition may be spared the loss of time and expense associated with sanatorium treatment and the fear of pulmonary tuberculosis.

EDWARD D. CRUPCHILL, M.D.

Munro, N. M. Oleothorax, with Observations on Twenty Cases. *Brit. M. J.*, 1932, 1, 554.

From a study of twenty cases of oleothorax, Munro concludes that in tuberculous empyema effusions complicating artificial pneumothorax, obliterative pneumothorax, and cases in which the compression produced by the introduction of air is insufficient, the procedure of choice is the injection of oil instead of air. He ascribes the beneficial results of oleothorax to the disinfecting action of this treatment and its more constant compression as compared with pneumothorax.

Olive oil is preferable to liquid paraffin. For the replacement of effusions, gomenol in graduated strengths added to the olive oil is of value because of its antiseptic properties.

In all cases of oleothorax, close observation is necessary to insure proper collapse. By such observation complications may be avoided. The chief complication is pleural effusion due probably to the irritation of a "virgin pleura." In none of the author's cases has a pleurocutaneous fistula developed.

The apparatus and the technique used for injection of the oil are described.

HAROLD M. BRILL, M.D.

Dolley, F. S. Internal Drainage of Lung Abscess by Extrapleural Compression. *J. Thoracic Surg.*, 1932, 1, 363.

Since the cough is the body's most efficient means of expelling unwanted material from the bronchopulmonary tract, any measure interfering with intrathoracic compression and therefore with coughing seriously interferes with pulmonary and bronchial drainage. The author believes that in some cases external drainage decreases the intrathoracic propulsive force and causes extension of the pathological process. In its stead he employs extrapleural compression. This procedure is especially applicable to cases in which the pneumonitis surrounding lung abscess is still extensive or continues to extend.

The abscess and its surrounding pneumonitis is determined by X-ray examination and the direction of the lobar bronchus draining the suppurative area is determined by bronchoscopic examination. At a site in a direct line with the bronchus draining the involved region where the abscess is nearest the lung surface, short portions of three or four ribs with their intercostal bundles are excised under local anesthesia, leaving for the floor of the wound the parietal pleura clear of muscle, vessels, and nerves except for the perosteum of the removed ribs. The wound is then packed very tightly with continuous 5-in. dry gauze and sutured without drainage, and the area



pulmonary pressure must overcome the resistance to expiration or collapse and a drop in the blood pressure must occur to a degree at which breathing is again possible. If neither occurs, suffocation results.

Dilatation of the bronchi is to be expected as it follows an increase in pressure proximal to constrictions of most hollow viscera. However as the thorax is rigid and its capacity is limited, dilatation cannot proceed indefinitely. The site of obstruction determines the extent of the dilatation. If the bronchioles are constricted, dilatation of the alveoli and later emphysema result. When the constriction involves larger bronchi, the depending smaller ones are dilated, but there is no emphysema. This is confusing, but the condition is not unlike hydrocephalus from ureteral block in which the kidney pelvis and not the tubules are affected. Thus, tracheal and bronchial constriction are seen without either bronchiectasis or emphysema.

Inflammatory processes softening the alveoli and bronchi and robbing them of their elasticity are probably important factors. If the stenotic lobe is hard and airless, the bronchi are dilated, whereas if the lobe is soft and contains air the alveoli, but not the bronchi are dilated.

With total bronchial obstruction, air absorption with resultant atelectasis occurs.

Tracheal and tracheobronchial obstruction present a varied anatomical picture.

Primary tracheal tuberculosis is very rare. Diffuse tuberculous deposits in the tracheal and bronchial walls are often thick and greatly obstruct the lumen. Syphilis produces ulceration and scarring. Glanders, typhoid fever, leprosy and other rarer conditions also attack the bronchi and trachea.

In both unilateral and bilateral stenosis the hilar glands are regularly enlarged, the pleurae are thick, the heart is often enlarged, and the spleen and liver are congested.

In acquired unilateral stenosis the anatomy is obscured by complications. A tumor may invade the entire surrounding thorax.

A single lobe depending upon a totally stenotic bronchus is very small, leathery dark, and airless, and contains small pockets of pus. When the obstruction is incomplete the lobe is usually decreased in size by scarring, the pleura thick, and the lung filled with small abscesses separated by gray firm fibrous pulmonary tissue.

Stenosis of the smaller bronchi and bronchioles is diffuse and more or less patchy.

Dyspnea is a prominent symptom. In high stenosis, breathlessness is very marked on exertion. Inspiration is prolonged, difficult, and wheezing, but expiration is unchanged.

The final stage of stenosis is suffocation. In this stage the respiration is gasping, shallow and rapid the face is gray, a cold sweat occurs, and the patient looks as though death impended. Under the influence of morphine the attack gradually subsides.

If only one of the major bronchi is obstructed, dyspnea is less severe. In stenosis of a single lobe

no dyspnea is present. In diffuse stenosis of the smaller bronchi or bronchioles, dyspnea is intense and the most prominent symptom.

Cough is fairly constant. The nearer the obstruction of the single bronchus to the carina, the more troublesome the cough. The sputum on a very thick and bloody. Occasionally the patient may be hoarse and experience difficulty in swallowing. Constitutional disturbances are not characteristic.

On physical examination of patients with stenosis of the trachea or at the bifurcation, dyspnea, and often a stridor is evident. Respiration is slow and labored, and the intercostal spaces are retracted. During the suffocative stage the respiratory rate is increased and the breathing much shallower. The face is inclined to be cyanotic. The right heart is often enlarged and the liver palpable. Frequently the underlying cause of the stenosis may be found on careful examination.

Direct evidence is given by the laryngoscope and bronchoscope. The X-ray is also of value in the diagnosis, especially when it is used with Spindel.

Complete stenosis of a major bronchus causes the very striking signs of massive collapse. The affected side of the chest is shrunken and still, the ribs are close together, the heart and trachea are deviated, the diaphragm is high and usually still, and the obstructed chest is dull or flat. Bronchoscopy usually reveals the obstruction, but the roentgenogram is most characteristic.

In intermittent unilateral stenosis the findings are strikingly varied. On one day all of the signs of total obstruction may be present and on the next day they may be gone. As a rule, however the changes take place more slowly.

There is reason to believe that all three forms of unilateral stenosis, total, partial, and intermittent, occur more frequently than is suspected. Every large tuberculous hospital has roentgenograms of totally gray chests without effusion—total stenosis—and roentgenograms showing an enormous amount of unilateral cavitation with a practically free second side suggesting at least partial stenosis.

Stenosis of a single lobe or less may cause distinct retraction of the chest wall over the closed area, especially lower lobe stenosis which affects the more yielding portions of the thorax. This sign is pathognomonic. It is not so pronounced over the upper parts of the chest but is distinct below the scapula. The respiration over the stenotic lobe is dull or flat and a change in the breath sounds is noted. In the diagnosis of lower and middle lobe obstruction the bronchoscope is invaluable but in upper lobe stenosis it is less satisfactory. The roentgenogram shows the characteristic density and other changes.

Much more difficult to recognize are diffuse stenoses of the smaller bronchi. Their symptoms are more characteristic than their signs. The diagnosis will usually rest on the cyanosis and constant dyspnea with acute exacerbations unaccounted for by higher stenosis or cardiac or vascular disturbances.

In the second experiment a gastrostomy was performed and six weeks later the cervical œsophagus was divided and the distal end closed. The animal was then fed by a tube from the proximal end to the gastrostomy opening. Twelve days later the gastrostomy was closed. The dog died on the ninth day following a marked loss of weight. At necropsy, the stomach was found contracted and to contain only a trace of gas. This experiment was later repeated with identical results on other dogs.

In the third experiment a gastrostomy was performed and followed by œsophageal exclusion. In spite of the complete loss of saliva the dog maintained its weight and strength. At the end of each feeding 1,000 c.cm. of oxygen were given through the gastrostomy tube. All food was then stopped and from 75 to 2,500 c.cm. of a mixture of equal parts of atmospheric air and oxygen was introduced into the stomach daily. The dog lost weight at a slightly greater rate than during simple starvation, but at the end of fourteen days was otherwise well. Resumption of feeding at that time resulted in a prompt return to the normal weight.

The author then discusses the function of oxygen and carbon dioxide in the gastro-intestinal tract and reviews the various theories on this subject. He believes that when the atmospheric pressure on the oral side is excluded a partial stasis results in the intestines with a true reversed peristalsis from the anal to the oral orifice, and that a lack of free oxygen in the tract influences the chemistry and probably also the bacterial flora. He does not agree that the total loss of saliva is the chief cause of rapid death in œsophageal obstruction.

His conclusions are summarized as follows:

1 Atmospheric air mixed with the saliva, food, and drink plays an important rôle in normal digestion.

2 The death of dogs with œsophageal occlusion depends on the complete absence of air in the stomach and intestines as well as starvation.

3 The total loss of saliva is of relatively little importance.

4 There is no reason to believe that the death of dogs with œsophageal exclusion is caused by trophic disturbances due to lesions of the peripheral nerves.

FRANK B. BERRY, M.D.

Symmers, D. Malignant Tumors and Tumor-Like Growths of the Thymic Region. *Ann. Surg.*, 1932, xci, 544.

This report is based on a series of twenty-five malignant tumors of the thymic region. The term "thymoma" is discarded as inexact and misleading and the older nomenclature employed. Eight of the twenty-five cases were cases of perithelioma, nine were cases of lymphosarcoma, five were cases of Hodgkin's disease, two were cases of epithelioma, and one was a case of spindle-cell sarcoma.

The symptoms and signs of thymic growths often develop late and when they are finally manifested death takes place within a few weeks or months. The lymphosarcomata may terminate abruptly in acute lymphatic leukemia. Certain tumors of the thymus are associated with the symptoms of myasthenia gravis. With regard to this group the possibility of surgical treatment should be kept in mind.

EDWARD D. CHURCHILL, M.D.

from which the rib sections have been removed is strapped very tightly.

Unless infection occurs, the wound is not opened for from fourteen to eighteen days. At the end of that time it is opened widely, repacked with an antiseptic solution, and left wide open. Thereafter the packing is changed every two or three days until rib regeneration has occurred firmly with the ribs in the compressed position. If further collapse is indicated, it is produced at a second stage. Gauze compression is limited to the original site. After the primary compression further procedures are in the nature of well-circumscribed thoracoplasties.

The author reports fourteen cases. In this series there was one death. Nine of the patients were rendered sputum free. EARL C. LATIMER, M.D.

Bellon, H., Singer, J. J., and Graham, E. A.: Bronchiectasis. III. Treatment. *J. Thoracic Surg.* 9:3, 4, 1917.

The authors divide the various treatments of bronchiectasis into the non-operative and the operative. In discussing the merits of each they point out that the condition can be considered cured only when the diseased portion of the lung has been removed or destroyed. They remind us that bronchiectasis is characterized by remissions, and that striking early improvement may later be nullified.

The most valuable non-operative method of treatment is postural drainage. This should be given a fair trial before any other procedure is suggested. Many patients with mild bronchiectasis require no other treatment. Either continuous or intermittent postural drainage may be used. The intermittent type should never exceed two or three sessions at a time. The authors prefer this method to bronchial irrigation (lavage). They have never observed disappearance of the dilatations following continued injections of lipiodol.

Other non-operative procedures include rest, control of the diet, climatic treatment, the thirst cure, heliotherapy, intravenous therapy, inhalations of superheated air with the admixture of drugs, and vaccine therapy.

Bronchoscopy does not often effect a cure, but may arrest the symptoms.

True bronchiectasis seldom responds to pneumothorax treatment even when the collapse is almost complete. If improvement does not occur within from three to six months under such treatment it is not likely to occur. However pneumothorax prepares the mediastinum for further operative procedures. It is possible to keep up the compression much longer by oleothorax than by pneumothorax. Frequently pneumothorax must be abandoned after six months because of the formation of adhesions. The authors are unable to state whether oleothorax will accomplish any more than pneumothorax or other forms of compression.

In cases in which pneumothorax is unsuccessful a preliminary period of compression by a paraffin

plombe might prepare the mediastinum for later thoracoplasty and eventually for lobectomy if that becomes necessary. In general, the results of thoracoplasty reported in the literature have not been striking, but relatively few patients have been subjected to this treatment. Some of the poor results may be attributed to the fact that the operation was not divided into a sufficient number of stages. Also in some cases more than uncomplicated bronchiectasis was treated by this method. As stated by Hedblom in 1924, lobectomy may be performed if the results are unsatisfactory.

The authors report a series of cases of their own and review cases collected from the literature which were treated by phenicectomy. They conclude that the patient has only a relatively small chance of being benefited by phenicectomy and a definite chance of having his condition made worse.

Ligation of branches of the pulmonary artery seems to offer no better prospect of cure than any other operative method. EARL C. LATIMER, M.D.

## HEART AND PERICARDIUM

Elkin, D. C.: Suture Wounds of the Heart. *Am Surg.* 9:3, 227-230.

Operation for a wound of the heart should always be carried out on the left side even though the wound is to the right of the sternum. The Dural-Barry median sternotomy is condemned because of the additional time required to make and close the incision and because the extent of the incision materially contributes to shock. The author finds that excellent exposure may be obtained by exposing the third, fourth and fifth left costal cartilages and ribs through a curved incision. After resection of the cartilage the internal mammary vessels are ligated and the pericardium is opened. Bleeding from the wound in the heart is controlled by pressure with the index finger until stitches are placed to close the wound. When the wound is posterior or behind the sternum a stay suture may be placed in the apex for traction on the heart.

EDWARD D. CRITCHFIELD, M.D.

## ESOPHAGUS AND MEDIASTINUM

Benjamin, N. N.: Complete Occlusion of the Esophagus in the Dog. Cause of Death (Occlusion totale de l'oesophage chez le chien: cause de la mort). *Lyon chir.* 9:3, 222, 49.

The author reports three experiments performed on dogs. In the first, the cervical esophagus was exteriorized and divided and the two ends, left open, were sutured to the skin. For a while the dog was fed by mouth, the ends of the esophagus being joined at the time of feeding by a tube. Food was then withheld. The dog lived with complete loss of his saliva for fourteen days. At the end of that time feeding was begun again, but death occurred on the seventeenth day. The chief cause of death was a foul infection about the open esophageal ends.

of peritonitis following injury of the hollow viscera. The shock usually develops immediately after the injury and is caused by the mechanical effect produced as the result of a circulatory disturbance in the automatic centers of the medulla oblongata by irritation of the subserous endings of the vagus and splanchnic nerves and the sensory spinal nerve endings in the abdominal wall. It usually lasts for one, two, or three hours. If it persists longer it is a sign that the irritation of the subserous nerve endings has become permanent. If the injured person is brought for treatment immediately, a decision can be made after three hours as to whether the injury is a contusion or a subcutaneous abdominal injury. Operation is indicated in the state of shock if the condition appears to be becoming worse.

Of the general symptoms, the pulse rate and temperature are of most importance. Bradycardia is observed with liver injury. Determinations of the blood pressure and the amount of hæmoglobin in the blood are of diagnostic aid.

The local symptoms are more important than the general symptoms. Early and spreading dullness in the lower half of the abdomen, or the cul-de-sac of Douglas is a sure sign of hæmorrhage. In gastro-intestinal perforation none or only a very little of the contents escapes into the abdominal cavity. Therefore the demonstration of free fluid is impossible or very difficult. It should be borne in mind that the fatty great omentum produces dullness over every contracted or lengthened portion of the intestines. Disappearance or diminution of liver dullness is considered a sure sign of gastro-intestinal perforation. Early meteorism does not indicate severe injury. It is produced by irritation of the retroperitoneal nerve plexus and therefore is observed also with fractures of the vertebral column and retroperitoneal hæmatomata. The most important local symptom is muscular rigidity. This originates in a reflex way as the result of traumatic and chemical irritation of the parietal peritoneum, which contains many nerves. It develops only when the stimulus affects the anterior portion of the parietal peritoneum. The administration of morphine which relieves the protective tension without abdominal injury, is contra-indicated. The old rule that morphine should not be given before diagnosis is established is still valid. The occurrence of vomiting two or three hours after the accident is not characteristic of an internal injury even when the vomitus is mixed with bile as it occurs also in simple contusion. If vomiting begins after three hours and recurs, it is an important sign of spreading peritonitis.

In sixteen cases of gastro-intestinal injuries perforating subcutaneous injuries were found. In thirteen cases the ileum, and in three cases the jejunum, was affected. The injury was single in fourteen cases and multiple in two. In three cases the mesentery was also injured. In every case the injury was produced by a dull object. In ten it was caused by the kick of a hoof, in four, by a blow

with a dull object, in one, by striking against a dull object, and in one, by a fall and compression (wheel) injury. In half of the cases there was an inguinal hernia. In the presence of hernia the increased intra-abdominal pressure may lead to rupture of the intestine without any external force. According to Bunge, the intestine is forced into the hernial sac, the external wall of the sac bulges, and when the limit of elasticity is passed, the sac bursts.

Retroperitoneal injuries of the duodenum at first are usually asymptomatic. The subsequent retroperitoneal phlegmon may be palpated as a deep resistance in the right side of the epigastrium. Phlegmons which have perforated into the abdominal cavity have an unfavorable prognosis. For a small perforation suture is sufficient, but for a larger one resection must be undertaken. In injury of the duodenum gastro-enterostomy should be done to relieve the suture.

In injuries of the large intestine the formation of an artificial anus may be indicated. Of the cases reviewed by the author, resection was necessary in only one. Of the sixteen patients, five survived, but none of them came under observation in the early stage. Only six entered the hospital within the first twenty-four hours, and of these only three came within the first twelve hours (eight, nine, and ten hours). Two were brought in after one day, three after two days, two after three days, and two after four days. Of those who survived, three were brought in after twenty-four hours (one on the third day) with pronounced symptoms of peritonitis.

Injuries of the mesentery and of the great omentum may be associated with injuries of the intestine or may occur independently.

Subcutaneous injuries of the liver were found in three of the cases reviewed, but in none was there a bradycardia or pain radiating to the right shoulder. In one case the patient was dying and could not be operated upon. In another the diagnosis was made at autopsy after death from pneumonia, and the liver injury was found to be subsiding. In the third case, the development of bilateral peritonitis after tamponade of the bleeding rupture could not be prevented.

Three isolated injuries of the spleen were observed. In the case of a patient who was thrown from a wagon upon his left side, 2.5 liters of liquid blood were found in the abdominal cavity. The spleen was removed and a transfusion of 600 c cm of blood was given by the Percy method. Death occurred from cardiac weakness on the fourth day. In the case of a patient who fell from a roof 4 m high, from 2 to 3 liters of fluid blood were found in the abdominal cavity and there was bleeding from the hilus of the spleen. In this case also the spleen was removed and a transfusion of 600 c cm of blood was given by the Percy method. Healing occurred by primary intention. Eosinophilia was still present after one and a half years, but there were no symptoms. In the third case, the patient fell from a haystack 6 m high and ran a pitchfork into his abdomen.

# SURGERY OF THE ABDOMEN

## ABDOMINAL WALL AND PERITONEUM

Wills, R. A., and Saphir, O: Migratory Peritonitis: A Clinicopathological Study of So-Called Hematogenous Peritonitis in Children. *Am J Dis Child* 1935 xliii, 6 a.

The authors report their clinicopathological findings in a series of twenty-one cases which had been diagnosed clinically as cases of hematogenous peritonitis.

In the literature upon the subject they found a confusion in the nomenclature. De Sanctis and Nichols speak of "primary peritonitis." Koch refers to "Idiopathic peritonitis," and Schopf calls the condition "Infants peritonitis." A pre-existing bacteremia is generally assumed.

In all of the cases studied by Wills and Saphir it was possible to demonstrate a distant focus of infection which was considered to be the source of the peritonitis. In nine cases in which an exploratory laparotomy was done no source of infection could be demonstrated within the peritoneal cavity. At autopsy in sixteen cases evidence of intestinal lesions was found. In eight cases cultures of the peritoneal exudate revealed streptococci. In two of the cases showing enteritis at autopsy pneumococci were discovered in the peritoneal exudate.

The authors believe that the evidence of a hematogenous origin of peritonitis is almost entirely negative and has little weight when there is positive evidence of a different origin. To explain the pathogenesis of hematogenous peritonitis it is necessary to assume: (1) a primary focus of infection, (2) bacteremia, and (3) entrance of the bacteria into the peritoneum and their production of a diffuse inflammation. It is not clear how the bacteria enter the peritoneal cavity.

In the cases reported by the authors, autopsy suggested that the peritonitis was due to invasion of the peritoneal cavity by bacteria from an organ either covered by or adjacent to the peritoneum. The authors therefore prefer to call the condition migratory peritonitis. They believe that, most commonly the primary inflammation is enteritis and the ensuing peritonitis is due to invasion of the peritoneal cavity by the bacteria from the diseased intestinal mucosa. Under normal conditions the peritoneum is so resistant that even when it is invaded by bacteria peritonitis does not develop.

The authors conclude that many cases of reported "hematogenous peritonitis" are cases of migratory peritonitis, and that the occurrence of peritonitis directly following a blood-stream infection without an intermediary lesion within or adjacent to the peritoneal cavity has not been proved.

EARL GARNER, M.D.

## GASTRO-INTESTINAL TRACT

Rossel, G: Olfactory Stimulation and Vertigo (*Eccitament olfattivi a carenze allucinatori*). *Spjmsicola* 1932, lxxvii, 75.

The author compared the nutrition of normal guinea pigs and rats with that of animals of the same species which were deprived of the sense of smell by resection of the olfactory organs. The animals were placed on measured diets of different foodstuffs and were weighed periodically.

The reactions to different foods varied. On certain diets the two groups of animals fared equally well, whereas on others the controls fared better than the animals operated upon and on still others the animals operated upon were better maintained than the normal animals. A. LOOSE ROSE, M.D.

Jakl J: A Clinical Study of Subcutaneous Injuries of the Abdominal Organs from Ball Force (*Zur Klinik der subcutanen Verletzungen der Bauchorgane durch stumpf Gewalt*). *Deutsche Zeitschr. Chir.* 93, 1922, 724.

In a hospital practice of nine years the author saw thirty-one subcutaneous injuries of the abdomen exclusive of contusions of the abdomen, hematoma of the abdominal wall, and later appearing hernia. A table of the injuries follows:

Injured organ	Rack	Move from heavy object	Body striking against fixed object	Wheel injury	Fall and wheel injury	Fall	Total
Abdominal wall		—	—	—	—	—	
Liver		—	—	—	—	—	1
Spleen	—	—	—	—	—	—	1
Kidney		—	—	—	—	—	1
Bladder		—	—	—	—	—	

Next to the general symptoms, the cause of a subcutaneous injury of the abdominal organs is of the greatest importance. There is hardly any mechanical insult which has not at some time produced a subcutaneous injury of the abdominal viscera, however slight it may be. Such injuries are most common to working men of middle age. The cause is often uncertain, but may be suggested by the history and the objective findings.

Three stages of subcutaneous abdominal injuries are differentiated: (1) a stage of shock, (2) a stage of often very transient, subjective improvement, and (3) a stage of collapse following hemorrhage or

Palpation revealed between the left costal margin and the umbilicus an elongated, very hard mass with smooth borders which was painless on pressure and fairly immobile. The tumor was not adherent to the skin and did not follow the movements of respiration. The rest of the physical findings were entirely negative, as were also all of the laboratory findings except a 4 per cent eosinophilia.

At exploration, a large infiltrating growth was found invading the abdominal wall, the transverse colon, and the gastrocolic ligament and ending at the greater curvature of the stomach in a hard cuneiform mass. The lesion was poorly limited and immobile. A tentative diagnosis of sarcoma was made. Part of the abdominal wall was excised and the wound was closed around a small drain.

The wound healed rapidly, but the drain evacuated a seropurulent discharge in which grayish-yellow bodies were discernible. Examination of the resected specimen showed, in the center of dense scar tissue, foci of inflammation and a typical mycelium. The mycelium was recovered also from the sinus.

The gastric contents were then aspirated and the fungus was recovered from a centrifugized specimen of gastric juice. There was absence of hydrochloric acid, lactic acid, and pepsin. X-ray studies of the stomach revealed a rough-edged, flat defect in the lower part of the greater curvature and absence of folds of the mucous membrane at this site. The rest of the stomach seemed normal, but was apparently attached to the large palpable mass.

On the basis of the reported cases and his own observation the author concludes that the invasion occurs through a lesion of the mucous membrane. In all cases examined with the X-ray the lesion was found on the greater curvature in the form of a flat defect. Sarcoma occurs most often on the lesser curvature. The author's case is the first in which the fungus was recovered from the gastric juice. Stravinsky believes it possible that the anacidity favored the localization of the actinomycosis, but admits also that the mucosal injury may have been responsible for the lack of acids.

In early cases the treatment should be complete removal of the growth. If this is impossible, large doses of iodine and X-ray irradiation may be used.

GEZA DE TAKATS, M.D.

Gatch, W. D., Owen, J. E., and Trusler, H. M.  
The Effect of Distention of the Bowel upon Its Circulation and upon Absorption from Its Lumen. *West J. Surg., Obst. & Gynec.*, 1932, 21, 161.

In a review of the literature the authors found that the majority of writers agree that in simple obstruction of the bowel without strangulation there is no toxæmia and death is due to loss of electrolytes from the blood, dehydration, and starvation. They agree also that the toxic substance found in the stagnant contents of the obstructed bowel is of bacterial origin and is absorbed in only small quantities through the intact intestinal mucosa.

In an experimental study of the effect of intra-intestinal pressure on the circulation in the wall of the intestine the authors noted that as the pressure was increased the circulation became slower, and when the intra-intestinal pressure became equal to the systolic blood pressure the circulation in the intestinal wall stopped.

In further studies, carried out on dogs, an intestinal loop, closed at both ends and drawn out of the abdomen with its circulation unimpaired was distended with gas and sodium cyanide and nicotine were then introduced. While the pressure in the loop was above the diastolic blood pressure, no absorption of either of the introduced substances was noted, but when the pressure was released absorption of the intestinal contents occurred and caused sudden death. When the loop was left within the abdomen, slow transperitoneal absorption of the cyanide occurred but there was no absorption of the nicotine. In similar experiments the contents of a closed intestinal loop of known toxicity were used as the toxic material.

From their findings the authors conclude that slow transperitoneal absorption of toxic material may occur through non-necrotic intestinal wall which has been rendered anemic by distention. No sudden absorption was noted on sudden release of the intra-intestinal pressure. Further experiments are now in progress to test the absorption of toxic material through distended loops showing varying degrees of necrosis of the mucosa.

In strangulation of the bowel the chief route of absorption is transperitoneal although there is clinical evidence to show that the peritoneum in contact with obstructed bowel can react to prevent toxins from entering the circulation.

G. D. DELPRAT, M.D.

Benedict, E. B., Stewart, C. P., and Cutner, P. N.  
The Role of Bile in High Intestinal Obstruction. *Surg., Gynec. & Obst.*, 1932, 14, 605.

In experiments carried out by the authors on dogs to determine the part played by bile in high intestinal obstruction, the intestines were obstructed at various levels from just below the bile and pancreatic ducts to 11 in below this point. Some of the animals then received normal saline solution and bile collected from a dog with a permanent cholecystostomy, and others, by a preliminary cholecystenterostomy with ligation of the common bile duct performed a week or more before the intestine was obstructed, received their own bile below the level of the obstruction. Control animals with similar obstructions received saline solution only. Nothing was given by mouth except a very occasional sip of water. Saline solution or saline solution and bile was given twice a day through an enterostomy.

The authors concluded that when the obstruction in the intestine was so high that no bile could be re-absorbed some benefit was derived from the administration of bile below the obstruction. While

One liter of blood was found in the abdominal cavity. The ruptured spleen was packed with iodoform gauze and a transfusion of 800 c.c.m. of blood was given by the Percy method. Recovery resulted.

Rupture of the spleen is characteristically followed by a shorter or longer asymptomatic interval. The treatment of choice is splenectomy although in one of the cases reviewed cure was obtained by packing.

Injury of the pancreas, which must be treated surgically by suture or partial removal with drainage, was not observed in the cases reviewed.

In injury of the kidneys expectant treatment is indicated. Of seven cases of renal injury nephrectomy was necessary in two in one for infection of a hematoma and in one for severe destruction of the kidney. In the five other cases expectant treatment was given. Among the characteristic symptoms are localization of the pains, irradiation of the pains to the testicles, colicky pains produced by blood clots, tumefaction and swelling in the lumbar region, and, most important sign, hematuria. Whenever possible cystoscopy was done.

Injuries of the suprarenal glands and ureters were not observed.

In one case there was an injury to the bladder which was first considered a contusion of the kidney on account of the rigidity and tenderness below the costal arch and the presence of blood in the urine. On the third day stabbing pains began suddenly in the hypogastrium. Operation revealed a 10-in. sagittal lacerated, and penetrating wound which extended from the fundus to the base and was infiltrated with blood. The wound was sutured.

In conclusion, the author states that successful results depend upon early surgical intervention which in turn depends chiefly upon a correct early diagnosis. The operative technique is satisfactory but the diagnosis must be improved. In every suspected case, laparotomy should be done as early as possible, before hemorrhage or peritonitis threaten life.

HARTMAN (2)

Fierlitz, A.: Hypochloremic Conditions and Replacement of the Chlorides by Intravenous Injections of Sodium Chloride (*Estados de hipocloremia y reposición sodica endovenosa*). *Sevilla med.*, 1931 xxix, 372.

The first studies of the chloride deficiency in intestinal obstruction were made in North America. Experiments carried out on dogs by Tibeston and Comfort in 1914, MacCann in 1918, MacCallum in 1920, and Hastings and Murray in 1921 demonstrated a marked decrease in the chloride of the blood and an increase in the non-protein nitrogen and the alkali reserve in this condition.

In 1923, Haden and Orr Brown, and Hartman and Rowntree reported beneficial effects in clinical cases from the subcutaneous or intravenous injection of a solution of sodium chloride. In 1927, Cosset, Bluet, and Petit Dufailly concluded that the intravenous administration of a hypertonic solution of

sodium chloride is of indisputable value as a preventive as well as a therapeutic measure for the intoxication due to obstruction of the digestive tract.

It is recognized that intestinal obstruction is always accompanied by a humoral syndrome characterized by: (1) an increase in the non-protein nitrogen, (2) an increase in the alkali reserve, (3) hyperglycemia, (4) polycythemia, (5) a transient leukocytosis, (6) an increase in the fibrin and viscosity of the blood, and (7) a decrease in the blood chlorides, the hypochloremia of Haden, Orr, and Bluet.

Studies in clinical cases and on animals demonstrate that the fall in the blood chlorides is least in occlusions of the esophagus and the cardiac end of the stomach and greatest in obstructions of the pylorus, duodenum, jejunum, and first part of the ileum. In obstructions of the terminal ileum and the large bowel it is almost negligible.

In the opinion of Bram and Barutten, the hypochloremia is of osmogenic origin. Kients and MacCann believe that it is of bacterial origin, whereas Roger, Garner, Whipple, and Gerard attribute it to an auto-intoxication caused by the absorption of toxic products from the obstructed portion of the gastro-intestinal tract.

In the presence of volvulus, which is associated with damage to the bowel wall, auto-intoxication predominates, whereas in simple intestinal occlusion without damage to the bowel wall auto-intoxication does not occur. In both conditions, however, there is a loss of chlorides. The author therefore believes that in simple occlusion without damage to the bowel wall the principal cause of death is the disturbance of the equilibrium of the body fluids resulting from the loss of blood chlorides.

From the point of view of treatment it is important to bear in mind that there is a great difference between obstruction with damage to the bowel wall and lesions without damage to the bowel wall, in which there is less danger as the disturbance of equilibrium of the body fluids can be corrected by intravenous or subcutaneous injections of a hypertonic solution of sodium chloride.

The amount and concentration of the salt solution employed must be determined for each case. Fierlitz reviews the indications for the treatment and warns of the complications which may occur if the concentration of the solution is not correct and the fluid is injected too rapidly. FRANK M. CORWY, M.D.

Stravinsky, T.: Gastric Actinomycosis (*Actinomycose gastrique*). *J. de chir.* 1931 xxix, 346.

Primary actinomycosis of the stomach is rare. Of the small number of cases reported, only three can be accepted as of primarily gastric origin. To the latter the author adds a fourth.

The author's patient was a man forty years of age who entered the hospital with a history of abdominal pain for three weeks and a slowly growing mass below the left costal margin. The pain was not severe and the appetite was not affected.

ings vary not only in different diseases but also in different cases of the same disease. On the basis of her observations in 102 cases, Pellini concludes that the dye is best given by mouth according to Sändström's technique of fractional doses. The examination must include a study of the emptying of the gall bladder by serial roentgenograms showing the changes in the organ produced by the standard meal of three egg yolks.

The author believes that a very dense shadow of the gall bladder is not an indication that the organ is damaged, but a sign that it has a good power of concentration. A faint shadow, on the other hand, does not always mean a decreased power of concentration. It is of importance as a sign of disease only when it is accompanied by other signs. Both a dense and a faint shadow show that the gall bladder is functioning. Between these two signs and the absence of a gall-bladder shadow there is a considerable difference. Negative cholecystographic findings do not always have the same significance. If there has been no flaw in the technique and if there are no well-marked hepatic changes, they suggest an obstruction in the biliary passages, obliteration of the cavity of the gall bladder, or a change in the gall-bladder walls. They may be related also to changes in the stomach, duodenum, or appendix. In this field of diagnosis as in all others, the roentgen and clinical findings must be considered together.

EUGENE T. LEDDY, M.D.

Johnston, C. G., and Brown, C. E. Studies of Gall-Bladder Function. III. A Study of the Alleged Impediment in the Cystic Duct to the Passage of Fluids. *Surg., Gynec. & Obst.*, 1932, *liv*, 477.

The authors report experiments undertaken to determine the pressure necessary to force fluid in either direction through the cystic duct in man and the dog, and review similar studies carried out by others. The authors' experiments were made on three cadavers, five fresh specimens of the human biliary tract, and eight anesthetized dogs. Manometric determinations of pressures within the gall bladder and cystic duct and readings of pressures outside of the gall bladder under bell-jar covers are recorded. In no instance was it possible to determine an impediment to the passage of fluid through the cystic duct at the pressures usually found in the biliary tract. In some of the animals a slight impediment to the flow of fluid from the gall bladder through the cystic duct was found at pressures of from 10 to 80 mm. of water, which are considerably below the normal pressure, but the authors did not consider this observation of any moment.

STANLEY H. MENTZER, M.D.

Hortolomei, N., Balan, N., and Burghiele, I. Mycotic Splenomegaly (La splénomégalie mycosique). *Ann. d'anat. path.*, 1932, *ix*, 145.

Of the primary splenomegalies first described by Banti in 1894 and by Debove and Bruchl in 1898,

some are believed to be caused by fungi. These usually belong to the clinical group described by Banti.

In 1905, Gandy, and in 1922, Gamna called attention to a form of splenomegaly which they believed to be a pathological entity, a "siderous splenogranulomatosis" characterized by fibrous degeneration and pigmentation of the follicles. Many cases have since been observed in Italy and Algiers.

The Algerian splenomegaly occurs almost exclusively in young males. It is accompanied by hæmatemesis, icterus, and severe anæmia with anisocytosis, poikilocytosis, and leucopænia. Often fever and ascites are present. From spleens with this condition Nauta and Pinoy obtained spirilla which sometimes reproduced the disease in rabbits. Since 1927 Nauta, Pinoy, Nicolle and Masson have regarded the fibrous pigmented lesions as mycotic nodules the spores of an aspergillus. The "mycelial threads" reported by some investigators have been variously interpreted by others. Chronic leg ulcers frequently accompany the splenomegaly and may constitute the initial lesion.

It has not yet been definitely proved that the fungi are the cause of the disease. Most of the fungi isolated have been non-pathogenic.

The authors report a case in detail with three photomicrographs. No cultures or inoculations were made.

ALBERT F. DE GROOT, M.D.

## MISCELLANEOUS

Hume, J. B. Diaphragmatic Hernia. *Brit. J. Surg.*, 1932, *ix*, 527.

Diaphragmatic herniæ are of the following types: (1) congenital, (2) acquired, non-traumatic and traumatic.

Congenital diaphragmatic herniæ are dependent upon a defect in the development of the diaphragm. They occur in the lumbocostal triangle, in the dome of the diaphragm and at the œsophageal orifice. They may be classified as:

1. Herniæ through the pleuroperitoneal hiatus.
2. Herniæ through the dome of the diaphragm.
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Herniæ through the pleuroperitoneal hiatus are due to failure of the median and dorsal portions of the pleuroperitoneal membrane to close. The hiatal defect varies from a small opening in the lumbocostal triangle to complete absence of the left half of the diaphragm. The herniæ usually occur on the left side. In the majority of cases the intestines are in the pleural cavity, the large intestine being to the left of the small intestine. There is no hernial sac.

Herniæ through the dome of the diaphragm are more difficult to explain on an embryological basis. Hume believes that they usually occur without a sac and are due to the rupture or destruction of a portion of the membranous diaphragm. They are more frequent on the left side than on the right.



the experiments appeared to indicate that, in dogs, a lack of bile in the segment below the obstruction was not a factor of fundamental importance in the fatal outcome; they did not preclude the possibility of benefit from the use of bile in the lower bowel in the human subject suffering from paralytic distention. The composition of bile with regard to bile salts and cholesterol was apparently not altered by the intestinal obstruction. When the chloride and water balance was maintained the survival period of the dogs with intestinal obstruction seemed to depend almost entirely on the level of the obstruction below the bile papilla and the fat reserve.

EDWARD ZOLLINGER, M.D.

Black, C. R.: Appendicitis Statistics. *West. J. Surg. Obst. & Gynec.* 93, 24, 76.

Black calls attention to the increase in the death rate from appendicitis as shown by mortality statistics in contrast to the low mortality rate as shown by statistics published by the large surgical clinics. He estimates that 75 per cent of the patients are operated upon in hospitals of 100 beds or less and finds no published data from institutions of this size. He urges that statistics be compiled according to standard rules as most of the published statistics are presented in such a form that one series cannot be compared with another. He urges also the recording of statistics pertaining to pre-operative and postoperative procedures.

G. D. DILLON, M.D.

Hayes, H. T.: Stricture of the Rectum. With Special Reference to Stricture in the Colored Race. A Report of 166 Cases. *Am. J. Surg.* 93, 21, 322.

The author believes that the tissues of the colored race have a greater tendency toward scar formation than those of the white race, and that this may account for the greater frequency of strictures in negroes as compared with whites. Strictures of the urethra are more common in negroes than in the members of any other race and are more common in negro males than in negro females. Strictures of the rectum are more frequent in negro females than in negro males. Gonorrhea of the rectum occurs in about 35 per cent of females with gonorrheal vaginitis.

Of 113 patients with rectal stricture treated since 1928, 31 were white, 90 were negroes, and were Mexicans. Only 9 of the negroes were males. In 3 cases, those of patients between one month and one year old, the stricture was congenital. In 66 cases the stricture occurred between the ages of twenty-one and thirty years, and in 33 between the ages of thirty-one and forty years. The greater frequency of stricture in these ages is explained by the fact that these are the periods of greatest sexual activity and therefore of the greatest frequency of venereal disease.

In some cases the stricture may be caused by fistula, rectal abscess, or fissure. Infection passes up the lymph channels or invades the mucosa or sub-

mucosa causing inflammation. Frequently rectal stricture has been attributed to tuberculosis.

Of 78 smears made in the cases reviewed, 69 per cent were positive for gonococci. In 81 cases 20 smears were made.

Of 103 Wassermann tests, 68 per cent are positive. In 57 cases no Wassermann test was made. While syphilis may play a definite role in the causation of rectal stricture, the author believes that gonorrhea is much more important.

The symptoms of stricture of the rectum are straining at stool, the passage of pus and blood, and marked constipation or incontinence. In long standing cases there are symptoms of obstruction such as the formation of large amounts of gas, colic like abdominal pain, and indigestion.

The diagnosis is easily made by digital, proctoscopic, or X-ray examination.

Most rectal strictures become tubular in time. As a rule a ring is present at some level of the canal, but a tubular stricture ultimately develops above or below it. The ring may form at the margin of the levator and/or at one of the rectal valves, but it is only part of the stricture.

In cases of rectal stricture in colored women there is nearly always an active ulcerating lesion with condylococci in the anal canal. Flatulent tracts usually occur below the ring.

The author has found the treatment of rectal stricture very unsatisfactory. In cases in which emergency procedures are unnecessary the stricture is dilated with the finger and the patient is instructed to irrigate the rectum with an antiseptic. In cases of very tight stricture in which the patient is obliged to strain at stool and a large amount of blood and pus is passed the stricture is dilated or incised under spinal anesthesia. If it is close enough to the anal margin a proctotomy is done and the patient then advised to continue the rectal irrigations and to report frequently for digital dilations.

Irrigations, dilations, and a proctotomy will often tide the patient over for several years, but in many cases colostomy becomes necessary eventually. In the cases reviewed, 3 colostomies are done. In 4 cases the author was obliged to perform excision of the rectum after the colostomy in order to clear up the residual infection. In only 1 case was he able to close the colostomy. In the cases of patients with syphilis, anti-syphilitic treatment did not stop the development of stricture nor improve the general condition in any way.

JOHN W. NIXON, M.D.

#### LIVER, GALL BLADDER, PANCREAS AND SPLEEN

Pellini, M.: The Importance of Cholecystography in the Diagnosis of Disease of the Gall Bladder. (L'importanza dell'ecografia colecistografica nella diagnosi delle colecistopatie) *Radiol. med.* 93, 21, 5.

Cholecystography is of great importance in the diagnosis of lesions of the gall bladder, but its food

ings vary not only in different diseases but also in different cases of the same disease. On the basis of her observations in 102 cases, Pellini concludes that the dye is best given by mouth according to Sándstrom's technique of fractional doses. The examination must include a study of the emptying of the gall bladder by serial roentgenograms showing the changes in the organ produced by the standard meal of three egg yolks.

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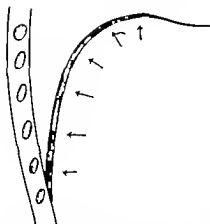


Diagram showing the direction of the intra abdominal pressure acting upon the diaphragm.

side probably because of the protection afforded by the larger right lobe of the liver. The stomach and a portion of the colon are invariably herniated. Other abdominal viscera may also enter the thorax. It is possible that hernia through the dome of the diaphragm may be caused by rupture of the diaphragm due to a sudden increase in the intra-abdominal pressure.

Of the hernia occurring through the esophageal orifice, the thoracic stomach is encountered much less frequently than the para-esophageal hernia.

The thoracic stomach is not a true hernia. It is due to failure of the caudal migration of the stomach to keep pace with the descent of other organs.

The para-esophageal hernia is a common variety. It is due to protrusion of the upper part of the lesser sac of the peritoneum through the orifice to the right of the esophagus up into the posterior mediastinum.

An important factor in the formation of acquired diaphragmatic hernia is a sudden increase in the intra-abdominal pressure. During violent muscular effort the intra-abdominal pressure may be increased to from 100 to 150 mm. Hg. Hernia produced entirely by the direct action of the intra-abdominal pressure are hernia through the foramen of Morgagni or para-esophageal hernia. Some acquired diaphragmatic hernia are due to tears in the diaphragmatic musculature caused by a sudden strain. The weakest portion of the diaphragm is at the junction of the central tendon and the muscle. When the diaphragm has been weakened by not being called upon to contract to its full extent or as the result of degenerative changes rupture is especially apt to occur at this site. Such a rupture does not affect the pleural or peritoneal covering. Traumatic diaphragmatic hernia may be caused by injury of the diaphragm by a bursting mechanism or tearing by a missile or a fractured rib. The symptoms depend entirely upon the degree of the injury and the ease with which the intra-abdominal contents can be forced into the pleural cavity. Wounds on the right side usually heal spontaneously and wounds on the left side may become sealed by adhesions.

ALTON OSWICK, M.D.

# GYNECOLOGY

## UTERUS

Curtis, A. H. Stricture of the Uterine Cervix  
*J Am M Ass*, 1932, xcvm, 861

Stricture of the cervical canal is so frequent that it demands the attention of internists and general practitioners as well as that of gynecologists.

The most common cause is gonorrhea, and the next most common cause, treatment of the uterus with radium. The condition is favored also by the use of the cautery and curette, instrumental abortion, and operations on the cervix. Stricture of the cervical canal resulting from atrophy and shrinkage of the uterus following the menopause with subsequent retention of mucoid secretion and ultimate contamination of the retained secretion is an important factor in the development of the well-known senile vaginitis. The author has seen cervical stricture in virgin women of the child-bearing age.

The pathologist has had relatively little opportunity to study the cervical canal because hysterectomy is so frequently preceded by dilatation and curettage.

Exploration of the canal with small-caliber dilators and studies of the cervical canal of removed uteri after their bisection in the frontal plane have revealed a rather high incidence of stricture and its sequelæ, pocketing and ballooning out of the canal above the site of stricture. In addition, the funnel-shaped contour of the canal in multiparæ has been noted. Unless the excision is carried to a rather high point, in the repair of such cervixes, there is likely to be a widening out of the canal above the site of repair similar to that found above a stricture from other causes.

Accumulations of mucus and tarry menstrual blood, distention of the uterine cavity, pyometra, endometriosis, and even cancer may result from cervical stricture. The present-day cures of leucorrhœa with the cautery knife, like the cures claimed in past years from curettage of the uterus, are ascribable to the establishment of adequate drainage by the destruction of cervical strictures.

The sudden appearance of otherwise unexplained leucorrhœa in a woman past the menopause is regarded by the author as pathognomonic of stricture of the cervical canal.

Other conditions resulting from stricture of the cervical canal are low-grade pelvic peritonitis, chronic inflammatory changes in the tubes and ovaries, and endometriosis, all of which may be attributed to back-pressure of retained secretions and menstrual blood.

The treatment of stricture of the cervix should follow recognized surgical principles. Dilatation of the canal, amputation of the cervix, and vaginal

hysterectomy are the procedures of choice, the method used depending upon the pathological changes present and the patient's age.

CHESTER C. DOHERTY, M.D.

Floris, M. Investigations of the Action of Ovarian Extracts on the Uterus (Ricerche sull'azione di alcuni estratti ovarici sull'attività dell'utero)  
*Riv Ital di Ginec*, 1932, xiii, 281

Using the technique of Mancini, Floris studied the pharmacodynamic action of ovarian hormone on the uterus of pregnant and non-pregnant rabbits. He injected the extract into the jugular vein, using both commercial preparations and liquor folliculi obtained directly from the matured follicles of the ovary of the cow.

He found that the ovarian extracts exerted a more or less marked effect in increasing and strengthening and in some cases, even regulating the contractions of the non-pregnant uterus. He believes that this pharmacodynamic action is due to folliculin and amines and possibly also to proteans. The intensity of the effect depends upon the sensitivity or excitability of the uterus which is dependent in turn on physicochemical and hormonal conditions in the organ. The beneficial homeostatic effect of ovarian preparations is due to their action in strengthening the contractions of the uterus and increasing the tone of the uterine musculature.

EUGENE T. LEDDA, M.D.

Wachenfeldt, S. von. Acute Hæmorrhages Endangering the Life of the Patient in a Case of Cervical Myoma. *Acta obst. et Gynec. Scand.*, 1932, xi, 32

The case reported was that of a woman twenty-one years of age. The first sign of the presence of the myoma was a life-threatening genital hæmorrhage at the time that menstruation was expected. Two similar cases reported by Whitehouse and Frommolt are reviewed. In both of these it was possible to demonstrate that the cause of the hæmorrhage was the rupture of a vein on the surface of the capsule of the tumor near the external uterine os. The author assumes that this was the cause also in his case although he was unable to prove it as the tumor was removed by enucleation, the capsule consequently being left in place.

Taylor, H. C., Jr. Endometrial Hyperplasia and Carcinoma of the Body of the Uterus. *Am J Obst. & Gynec.*, 1932, xxii, 309

The conception of endometrial hyperplasia as a precancerous lesion is based upon morphological, biological, and clinical similarities between this condition and cancer.

**Morphological similarity.** Evidence of morphological similarity is dependent largely upon individual conception of form and cannot be proved directly. However a study of 85 cases of endometrial hyperplasia suggested that the condition presents a series of histological pictures, the endometrium in some cases differing little from the normal and in others showing histological changes closely resembling those of certain differentiated carcinomas.

**Biological similarity.** The frequent association of endometrial hyperplasia with adenomyosis or invasion of the muscularis by mucosal tissue and the tendency of the condition to recur after curettage are perhaps to be interpreted as representing in miniature 2 of the chief properties of malignancy viz. infiltration and recurrence.

At least 6 cases of supposed transformation of hyperplasia of the endometrium into carcinoma have been reported in the literature. However such reports must be regarded critically.

In a review of the histories of 55 cases of carcinoma of the body of the uterus it was found that at some time before the operation for cancer a large number of the women had been under treatment for abnormal uterine bleeding.

The presence of diffuse endometrial hyperplasia and carcinoma in the same uterus was found in 5 of the author's cases and has been reported in the literature. In 3 of the author's cases the carcinoma occurred with hyperplastic glands which were probably part of an adenomatous polyp. In 2 cases carcinoma was associated with areas of invasion of the superficial muscularis by benign glands constituting a condition termed adenomyosis and indicating abnormal properties in the basal endometrial glands.

Although in a total of 52 cases of cancer there were only 15 with definite histological evidence of an associated hyperplastic condition, it is possible that in many advanced cases pre-existent benign lesions had been completely replaced by the carcinoma.

**Clinical similarity.** Several cases in the author's series indicated that, in spite of very careful study endometrial cancer may be mistaken for a benign lesion. Such cases lead to the following conclusions.

Postmenopausal bleeding from the uterine canal, even if limited to a single attack, should always be treated by curettage.

Curretted material, however scant, should always be subjected to microscopic examination. As an incomplete curettage is unsatisfactory as a diagnostic measure as a small carcinoma may be missed by the instrument. In suspicious cases a single microscopic section of curettage is not sufficient to rule out cancer as the microtome may not cut the particle containing the growth.

The histological differentiation of endometrial hyperplasia from certain types of carcinoma sometimes requires considerable experience and the examination of multiple sections.

Whether from a practical standpoint, endometrial hyperplasia is to be regarded as a precancerous lesion and treated as such remains an open question. The relative frequency of the condition undoubtedly indicates that the danger of malignancy is not always present. Nevertheless it appears that when the hyperplasia is at all marked the possibility of a predisposition to cancer should be considered and the condition regarded with the same suspicion as the diffuse forms of hyperplasia of the breast epithelium. In the cases of women at or past the menopause age an adequate dose of radium is the most efficient method of controlling bleeding and possibly the best prophylactic measure against the development of cancer.

E. L. CORVILL, M.D.

Gallheim and Gossy: *Pyometra After Treatment of Cancer of the Uterine Cervix with Radium* (*Les pyocystites après traitement du cancer de l'utérus par le radium*). *Presse méd. Par.* 57, 21, 242.

Pyometra complicating cancer of the cervix has become much more frequent since the use of radium therapy. Of 751 cases of cancer of the cervix, it occurred in 8 (.06 per cent).

Predisposing factors are (1) failure of the radiation to stop the secretory activity of the endometrium because of improper application of the radium, (2) uterine infection (cancer of the cervix are always infected, commonly with a variety of organisms), (3) tissue destruction by the radium, (4) stenosis of the cervix, and (5) atony of the muscle wall of the uterine corpus with loss of expulsive force.

Pyometra may appear from a few weeks to several months after the radium treatment. It is of clinical types, the open and the closed.

In the open type the symptoms are milder and the cervix is not tightly closed. The passage of a uterine sound can be done without much difficulty and is followed by free drainage and amelioration of the symptoms. The prognosis in the open type of pyometra is good.

In the closed type of pyometra the onset is tumultuous and the course more hectic. The patient is quite septic and has a high fever but uterine cancer is not always present. The occlusion of the cervix often prevents the passage of ordinary dilators. The prognosis in this type is poor.

Possible complications of pyometra are (1) spontaneous rupture of the uterus followed by general peritonitis, (2) phlebitis, especially of the pelvic veins, (3) pelvic peritonitis, (4) pelvic cellulitis, (5) septicemia, and (6) peritonitis from perforation of the uterus in attempts to dilate the stenosed cervix.

The diagnosis is usually made easily from the history of previous radium treatment, the evidence of infection, paroxysmal uterine colic, enlargement of the uterus, and the free discharge of pus from the uterus following the passage of sound or dilator.

The treatment should be both prophylactic and curative. Prevention may be accomplished by thorough disinfection of the cervix and the use of vaccines before irradiation with radium, the use of a good technique in the application of the radium so that the corpus of the uterus will be fibrosed without stricture formation in the cervix, frequent dilatation of the cervix after the radium treatment to promote free drainage of the uterus, and frequent observation of the patient after the irradiation.

Curative measures include serum therapy and dilatation of the cervix to permit the escape of the purulent uterine contents. In some cases fundal, subtotal, or total hysterectomy may be advisable but this is likely to be exceedingly difficult and dangerous because of the peritonitis adhesions, cellulitis and tubo-ovarian involvement associated with the pyometra.

GEORGE H. GARDNER, M.D.

### EXTERNAL GENITALIA

Forlini, E. Melanotic Carcinoma of the Clitoris (Carcinoma melanotico del clitoride). *Riv. ital. di ginec.*, 1932, **xi**, 306.

The author reports the case of a woman fifty-four years of age who presented a lesion involving the whole glans of the clitoris. There was no inguinal adenopathy. The tumor was excised and a diagnosis of melanotic carcinoma was made. Metastasis to the abdominal nodes was found eight months later, and the patient died eleven months after the operation. The diagnosis was confirmed by X-ray examination, but autopsy was not performed. From a careful microscopic examination of the tissue Forlini concluded that the lesion was an alveolar cancer of the epidermis with elements which retained a melanoblastic potentiality. He believes that the regional nodes should be removed even when they do not seem to be involved by metastasis.

EUGENE T. LEDDY, M.D.

### MISCELLANEOUS

Cannon, D. J. Resection of the Presacral Nerve for Intractable Dysmenorrhœa Complicated by Severe Bleeding. *Irish J. M. Sc.*, 1932, No. 76, 150.

The author reports a case of dysmenorrhœa in an unmarried woman twenty-five years of age which was completely relieved by resection of the presacral nerve together with resection and mobilization of the ovaries after it had resisted treatment by dilatation of the cervix, curettage, resection of the ovaries, suspension of the uterus, and endocrine therapy including irradiation of the pituitary gland. He believes that the mobilization of the ovaries was responsible for the relief of the premenstrual pain and the resection of the presacral nerve for the relief of the dysmenorrhœa and the control of the heavy flow.

According to Whitehouse, dysmenorrhœa is always due to abnormal activity of the luteinizing

hormone of the pituitary gland, other anomalies being at most only contributory. In Cannon's case glandular hyperplasia was present and there were no fragments of decidua. Cannon attributes the dysmenorrhœa to a primary fault of the nervous mechanism controlling menstruation, and believes that psychotherapy begun early might have been effective.

Cannon states that dilatation and curettage are beneficial only in cases with spasm of the circular fibers of the internal os and fail to relieve those with irregular contractions of the body of the uterus.

The operation for resection of the presacral nerve is described.

HENRY S. ACKEN, JR., M.D.

Loeb, L. The Specificity in the Action of the Anterior Pituitary of Different Mammals as Well as of Urine of Pregnant Women on the Sex Organs and Thyroid Glands of Immature Female Guinea Pigs. *Endocrinology*, 1932, **xvi**, 129.

The investigations reported by the author showed that preparations of the anterior lobe of the pituitary gland from different mammalian species differ from one another in their effects on the sex organs and the thyroid of the immature guinea pig.

According to their action on the ovary the preparations may be arranged in the following order: (1) anterior lobe of the pituitary gland of the guinea pig, (2) anterior lobe of the pituitary gland of the rabbit and cat, (3) the urine of pregnant women, and (4) various preparations of the anterior pituitary gland of cattle (pieces of the gland, acid and alkali extracts, and residues). This order indicates a decreasing tendency to promote growth and an increasing tendency to promote the development of theca interna lutein bodies and interstitial glands in the absence of growth-promoting functions. Preparations 2 and 3 had, in addition, a pronounced tendency to cause maturation of the granulosa which sometimes extended even to smaller follicles, while Preparation 1 tended to cause maturation of only the granulosa of very large follicles which would naturally undergo maturation. Preparation 2 had a definite tendency to accelerate the growth of follicles, while Preparation 3 failed to show this tendency or showed it in only slight degree.

According to their effects on the thyroid gland of the immature guinea pig the order of these preparations is as follows: (1) acid and alkali preparations and, to a less extent, pieces of gland and residue after extraction of the anterior lobe of the pituitary gland of cattle, (2) rabbit, (3) cat, and (4) guinea pig, and (5) the urine of pregnant women. This order corresponds to a decreasing hypertrophy. Preparations 1 caused the greatest hypertrophy, Preparation 5 the least, and Preparation 4 almost as little as Preparation 5. In this connection however, it is necessary to take into consideration the fact that the amounts of the various preparations from the anterior lobe of the pituitary gland of cattle which were administered differed in the quantity of the substance causing hypertrophy of the thyroid gland, and that the quantity of the anterior lobe of the

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In a review of the histories of 122 cases of carcinoma of the body of the uterus it was found that at some time before the operation for cancer a large number of the women had been under treatment for abnormal uterine bleeding.

The presence of diffuse endometrial hyperplasia and carcinoma in the same uterus was found in 5 of the author's cases and has been reported in the literature. In 3 of the author's cases the carcinoma occurred with hyperplastic glands which were probably part of an adenomatous polyp. In 2 cases carcinoma was associated with areas of invasion of the superficial muscularis by benign glands constituting a condition termed "adenomyosis" and indicating abnormal properties in the basal endometrial glands.

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The histological differentiation of endometrial hyperplasia from certain types of carcinoma sometimes requires considerable experience and the examination of multiple sections.

Whether from a practical standpoint, endometrial hyperplasia is to be regarded as a precancerous lesion and treated as such remains an open question. The relative frequency of the condition undoubtedly indicates that the danger of malignancy is not always present. Nevertheless it appears that when the hyperplasia is at all marked the possibility of a predisposition to cancer should be considered and the condition regarded with the same suspicion as the diffuse forms of hyperplasia of the breast epithelium. In the cases of women at or past the menopause age an adequate dose of radium is the most efficient method of controlling bleeding and possibly the best prophylactic measure against the development of cancer.

E. L. CORSELL, M.D.

Guthrie and Goony: Pyometra After Treatment of Cancer of the Uterine Cervix with Radium (Les pyometres après traitement du cancer du col utérus par le radium) *Presse méd., Par* 1929, 21, 242.

Pyometra complicating cancer of the cervix has become much more frequent since the use of radium therapy. Of 751 cases of cancer of the cervix, it occurred in 8 (1.06 per cent).

Predisposing factors are (1) failure of the radiation to stop the secretory activity of the endometrium because of improper application of the radium, (2) uterine infection (cancer of the cervix is always infected, commonly with a variety of organisms), (3) tissue destruction by the radium, (4) stenosis of the cervix, and (5) atony of the muscle wall of the uterine corpus with loss of its peristaltic force.

Pyometra may appear from a few weeks to several months after the radium treatment. It is of 2 clinical types: the open and the closed.

In the open type the symptoms are milder and the cervix is not tightly closed. The passage of uterine sound can be done without much difficulty and is followed by free drainage and amelioration of the symptoms. The prognosis in the open type of pyometra is good.

In the closed type of pyometra the onset is insidious and the course more hectic. The patient is quite septic and has a high fever but uterine colic is not always present. The occlusion of the cervix often prevents the passage of ordinary dilators. The prognosis in this type is poor.

Possible complications of pyometra are (1) spontaneous rupture of the uterus followed by general peritonitis, (2) phlebitis, especially of the pelvic veins, (3) pelvic peritonitis, (4) pelvic cellulitis, (5) septicemia and (6) peritonitis from perforation of the uterus in attempts to dilate the stenosed cervix.

The diagnosis is usually made easily from the history of previous radium treatment, the evidence of infection, purulent vaginal discharge, enlargement of the uterus, and the free discharge of pus from the uterus following the passage of a sound or dilator.

With regard to the relationship between the changes observed in the sex organs and the thyroid gland after the administration of preparations of the anterior lobe of the pituitary gland the author says that while there is no connection between the promotion of follicular growth in the ovaries and hypertrophy of the thyroid gland, there is a certain parallelism between the tendency of certain preparations of the anterior lobe of the pituitary gland to inhibit full growth of the follicles and intensify follicular atresia, to produce theca interna lutein bodies and interstitial gland on the one hand and induce hypertrophy of the thyroid gland on the other. This parallelism suggests that the substance causing thyroid hypertrophy and the substance causing luteinization of the ovary are identical. Apparently contradictory to this conclusion is the failure of the urine of pregnant women to cause thyroid hypertrophy while

it causes luteinization. The possibility was suggested that this urine contains a substance which antagonizes the effect of the anterior lobe of the pituitary gland on the thyroid gland (experiments have shown that this is not the case) or that the active substance in the urine which acts on the ovary is different from the active substance present in the anterior lobe of the pituitary gland. The recent experiments of Reichert, Pencharz, Simpson, Meyer and Evans, which showed that, in the dog the urine of pregnant women becomes ineffective after hypophysectomy, are in harmony with the author's assumption that the substances active in the urine of pregnant women and in the anterior lobe of the pituitary gland are not identical. However, there is still the possibility that the action on the thyroid and the luteinizing effect on the ovary are due to different substances.

CHARLES BARON, M D



pituitary gland of the guinea pig is less than that of the anterior pituitary gland of the cat or rabbit. Moreover the quantity of preparations of the anterior lobe of the pituitary gland of cattle administered was on the whole greater than the quantity of the preparations of the anterior lobe of the pituitary gland of the guinea pig, rabbit, and cat.

The difficulties in interpretation arising from these differences in absolute quantities can be overcome to some extent by: (1) varying the quantities of anterior lobe of the pituitary gland used in each species and determining the influence of these variations on the effects produced by these preparations, and (2) comparing the action on the thyroid gland with the action on the sex organs of the guinea pig and thus obtaining a standard of efficiency of the material administered.

Interpretation requires the consideration of three possibilities. It is possible, for instance, that a single active principle in the anterior lobe of the pituitary gland may be responsible for all of the changes observed in the sex organs and thyroid of the guinea pig. If present in small quantity this substance accelerates the growth of follicles. As soon as the follicles reach a large size they mature and ovulation occurs. Mature follicles which do not rupture may be converted into large granulosa lutein bodies. If the substance is present in a larger quantity it does not induce the rapid growth of follicles or the maturation and rupture of large follicles but, instead, accelerates stretch of the follicles and with this stretch causes hypertrophic and hyperplastic changes in the theca interna and leads to the production of theca interna lutein bodies and interstitial gland. In small or medium-sized growing follicles the granulosa may mature prematurely and as a result a premature aging may take place and the theca interna may hypertrophy around such growing follicles. The anterior lobe of the pituitary gland of different species differs in the amount of this substance it contains. Only when the substance is present in larger quantities does the thyroid become hypertrophic.

The second possibility to be considered is that there may be at least two active substances in the anterior lobe of the pituitary gland, one of them causing the growth, maturation, and rupture of large follicles, and the other causing the changes noted in the sex organs and hypertrophy of the thyroid gland. In different species these two substances are present in different quantities. Thus, in the anterior lobe of the pituitary gland of the guinea pig the growth-promoting substance greatly predominates, while in the anterior lobe of the pituitary gland of cattle the second substance predominates. The urine of pregnant women also contains a substance which induces histolysis processes.

The third possibility to be considered is that the effects called forth by the anterior lobe of the pituitary gland of different species depend not only on the character of the species from which the lobe is taken but also on the species of animals used as test organisms.

The author found that the effects characteristic of each species could be intensified by the use of larger quantities of the various substances, but so far he has been unable to abolish the differences observed in different species by varying the amounts used.

With regard to the findings in the vagina Leeb was that a correspondence between the development of the follicles and the proliferation of the vaginal epithelium was noted. If large follicles develop without the presence of inhibiting factors the growth in the vagina may be incomplete. This may be true even in normal immature guinea pigs. The full development of the corpus luteum represents an inhibiting factor. During the normal cycle a proliferation of the vagina does not take place, notwithstanding the presence of mature follicles, until the corpus luteum has begun to regress and the next ovulation is imminent. The administration of preparations of the anterior lobe of the pituitary gland which cause the development of hypotrophic follicles with or without interstitial gland or theca interna lutein bodies leads to inactivity of the vagina (effects of extracts of the anterior lobe of the pituitary gland of cattle). The presence of mature follicles in combination with interstitial gland or lutein bodies leads usually to an incomplete proliferation of the vagina. The presence of mature follicles not associated with the formation of interstitial gland or lutein bodies, and especially the presence of these structures directly preceding ovulation, leads to full proliferation of the vagina with the production of keratin. The injection of the urine of pregnant women causes a very slight proliferation of the vagina, presumably due to the presence of theca and thecal (Doley and associates) in such urine. Is cases in which the development of the interstitial gland was so pronounced that it occupied the greater part of the ovary the vagina presented a condition similar to that observed in pregnant and hysterectomized guinea pigs, in which an excess of mucoid secretion is produced in the large cylindrical surface cells of the epithelium and exerts pressure on the layer of flat epithelial cells underneath. Such changes were noted after about twenty days when urine was injected daily and also after long continued inoculations of preparations of the anterior lobe of the pituitary gland of the rabbit.

These observations suggested that not only corpus luteum, but also interstitial gland and lutein bodies may exert an inhibiting effect on the vagina. However it will be necessary to study further the variable efficiency of mature follicles in setting free the growth-promoting factors acting on the vagina under different conditions. It was found that the stages intermediate between full proliferation and a resting condition would have escaped recognition if vaginal smears alone had been used.

Proliferation of the mammary gland was usually associated with a full development of mature follicles. The behavior of the uterus varied somewhat under different conditions and needs further experimental analysis.

the stage of labor at the time the thymophysin was administered

Group 3. One case, in which the drug was used to strengthen contractions in preparation for cesarean section. The uterine segment and cervix were sufficiently dilated to permit a low cesarean section.

The thymophysin produced perfectly rhythmical contractions with good relaxation of the uterus between the pains. It had no harmful effects on the mother or the child. In the dosage used, it had no effect on the blood pressure when it was administered subcutaneously or intramuscularly.

The indications are as follows:

1. Induction of labor. In the author's three cases good results were obtained with a dose of 0.2 cc every thirty minutes until good contractions appeared and then as frequent injections as necessary of 0.5 cc in the cases of primiparae and 1.0 cc in the cases of multiparae. During the first stage not more than 0.5 cc should be given. When thymophysin is used in preparation for cesarean section in cases of overdue labor it has the advantage of dilating the lower segment of the uterus and the cervix so that a low section can be performed and brings the patient to operation with good uterine contractions. In cases in which section is to be done after rupture of the membranes it is indicated especially to lessen contamination of the uterine cavity and facilitate low section. For such cases the author recommends giving a dose of 0.5 cc while preparations are being made and 0.5 cc more five minutes before the operation is begun.

2. Primary inertia. In this condition thymophysin will act only if the retractability of the uterus is not impaired. It is therefore contra-indicated in cases of hyperdistention of the uterus such as hydramnios and multiple pregnancies. If primary inertia is recognized early, and 0.5 cc of thymophysin or less is given promptly and repeated as often as necessary the initial disturbance will be corrected, the period of dilatation shortened, and the use of forceps will be rendered unnecessary by the prevention of fatigue and hypertonicity of the uterus during the second stage. By shortening the duration of labor and rendering the application of forceps unnecessary it decreases the danger of cerebral hemorrhage in the child and of injury to the genital tract of the mother. It will also decrease the psychic trauma of prolonged labor with interference, which is manifested later by frigidity during coitus, dyspareunia, amenorrhoea, and dysmenorrhoea. In cases of rupture of the membranes with primary inertia, thymophysin should be used promptly, before intra-partum infection sets in.

3. Eclampsia. The author believes that thymophysin is indicated in cases of eclampsia in which it is too late for cesarean section and the head is not low enough for the application of forceps.

In conclusion the author says that during the expulsive period thymophysin is not much superior to pituitrin.

W. H. MARTINEZ, M.D.

Danforth, W. C. The Treatment of Occiput-Posterior Positions, with Especial Reference to Manual Rotation. *Am J Obst & Gynec*, 1932, xxiii, 360.

This report is based on 256 right and 29 left occiput-posterior presentations. Good obstetrical strategy demands that the woman be gotten into the second stage with her physical powers as nearly intact as possible and with minimal impairment of her nervous forces. Accordingly the judicious use of some form of opiate is often of value.

Dilatation should occur by the normal mechanism. Interference to hasten it should usually be avoided. In carefully chosen cases, however, it may be completed manually or by Dührssen's incisions.

In 65.4 per cent of the cases reviewed delivery occurred spontaneously or was effected by the application of forceps at the outlet.

If failure of anterior rotation occurs, or if the head rotates anteriorly only part way, the following method of manual rotation is employed.

After waiting for the head to become engaged and for any necessary moulding to occur, the right hand is introduced and the head grasped with the fingers and thumb which are spread out so that the force used will be distributed over the fetal head as widely as possible. At the same time the left hand is applied to the mother's lower flank, as nearly as possible under the fetal shoulder. Simultaneously the hand within the vagina, which is grasping the head, and the external hand rotate the head and the body. For success in this maneuver it is necessary for the uterine musculature to be relaxed with ether. If possible, the head is overcorrected.

The thumb of the internal (right) hand is then withdrawn, the tips of the fingers being left in contact with the lower part of the child's face in order to prevent backward rotation into the original position. At this point the operator's left hand leaves the abdomen of the mother and is replaced by the hand of an assistant or nurse. The replacing hand may be applied under the sterile sheets without disturbing asepsis. The left blade of the forceps is then introduced by the operator with his left hand the blade being passed inside the fingers of the right hand which still remains in place. After the introduction of this blade an assistant holds the handle and at the same time exerts gentle traction laterally. In this way a gentle lever action is produced, the blade of the forceps causing pressure against the child's head instead of the operator's hand, thus hindering backward rotation. The right blade is then introduced and the blades are closed. With 1 or 2 fingers the operator assures himself that the occiput remains anterior. Extraction may then be done.

This procedure was carried out in 76 of the cases reviewed. In 9 it was attempted but failed and version was done at once. In 8 cases version was done without any attempt at manual rotation. In 104 cases simple outlet forceps were used, after

## OBSTETRICS

### PREGNANCY AND ITS COMPLICATIONS

Clason, S. *Eclampsia or Salvarian Poisoning?*  
Three Deaths with a Debatable Cause (Eklampsi  
oder Salvarianvergiftung? Drei Todesfälle mit  
dunkelbarer Ursache) *Acta obst. et gynec. Scand.*  
1932 xii, 40.

In most obstetrical reference and textbooks no mention is made of the fact that the cerebrospinal form of salvarian poisoning is clinically and anatomically so extremely like eclampsia that a differential diagnosis is almost impossible. The author reviews the literature and reports three cases. The similarity of the conditions renders treatment difficult as it is not advisable to give the adrenalin injections indicated in salvarian poisoning if eclampsia cannot be excluded.

In this connection Clason discusses the question as to whether or not the risk of salvarian poisoning is greater during pregnancy than at other times. As he finds certain indications suggesting an affirmative answer he recommends great caution in the treatment of pregnant women with salvarian.

Lorenzetti, F. *A Possible Error in the Diagnosis of Abortion. Clinical and Histopathological Considerations* (Su di un possibile errore in tema di diagnosi di aborto. Considerazioni cliniche ed istopatologiche) *Clin. ostet.*  
1932 xiv, 87.

The author reports three almost identical cases presenting the typical symptoms of an interrupted or disturbed pregnancy with possible internal abortion. Studies of the uterine scrapings showed no evidence of uterine pregnancy but disclosed a non-homogeneous proliferative process of the uterine mucosa with disintegration of the superficial layer and necrobiotic changes in the deep layers secondary to a circulatory disturbance. The author believes these changes may have been due to a persistent mature graafian follicle with prolonged stimulation of the endometrium or to some other peculiar functional anomaly of the ovary. Conservative treatment failed to cause improvement, but curettage was followed promptly by cure.

A LOUIS ROSE, M.D.

### LABOR AND ITS COMPLICATIONS

Slamons, J. M. *The Induction of Labor at Term.*  
(*See J. Obst. & Gynec.* 1932, xii, 494)

In the method recommended by the author 5 cc of castor oil and 50 gr. of quinine are given and four hours later the membranes are ruptured. Unless a complication of pregnancy demands haste, the character of the cervix should be favorable to rupture of

the membranes before this method is employed. Induction is postponed until the internal os dilates two fingers.

After the membranes have been ruptured it is desirable to check the fetal heart sounds, to ascertain by abdominal palpation the relation of the head to the pelvic inlet, and to note the degree of uterine retraction following the escape of the amniotic fluid. A careful study may reveal conditions unfavorable to the use of pituitary extract, but the author has never encountered them. As a rule a small pledget of cotton which will fit the nostril is fastened to a string to facilitate its removal, saturated with pituitary extract, and placed between the septum and the inferior turbinate.

This procedure may sometimes shorten the course of labor although it is not recommended for that purpose.

The author has employed the method described in 133 cases. One hundred of the women were multiparae. None of the mothers died, but one of the infants was born dead. The author believes that the stillbirth must be charged against the method or no other cause could be ascertained.

E. L. CHAMBERLAIN, M.D.

Martile, Ulla, L. *The Use of Thyrophysin in Obstetrics* (El empleo de la tirofina en obstetricia) *Prog. Obst. Gynec.* Madrid, 1932, xii, 85.

Thyrophysin was introduced in obstetrics in 1925 by Ternstroem. It is a combination of the extract of the posterior lobe of the pituitary gland and extract of the thymus. The thymic extract inhibits the tetanic contractions frequently produced by pituitaria used alone and prevents fatigue of the uterine muscle or relieves it if it is not excessive. Its action is not specific as it can be produced by other substances especially proteins and their derivatives.

Eleven cases in which thyrophysin was employed are reported. They are divided as follows:

Group 1: Three cases in which labor was overdue. In these cases the thyrophysin was used to induce labor. Two of the women had a contracted pelvis and were delivered by Kröning's section after good uterine contractions had begun. The other woman was delivered spontaneously.

Group 2: Seven cases of primary inertia. In these cases the thyrophysin was used to strengthen the uterine contractions. In six, delivery occurred spontaneously and in one case the forceps were used. Failure of thyrophysin in the last case was attributed to its late use. Five of the women were primiparae. The duration of labor after the administration of the thyrophysin varied from thirty minutes to six and a half hours, depending on the case and

the stage of labor at the time the thymophysin was administered

Group 3. One case, in which the drug was used to strengthen contractions in preparation for cesarean section. The uterine segment and cervix were sufficiently dilated to permit a low cesarean section.

The thymophysin produced perfectly rhythmical contractions with good relaxation of the uterus between the pains. It had no harmful effects on the mother or the child. In the dosage used, it had no effect on the blood pressure when it was administered subcutaneously or intramuscularly.

The indications are as follows:

1. Induction of labor. In the author's three cases good results were obtained with a dose of 0.2 c cm every thirty minutes until good contractions appeared and then as frequent injections as necessary of 0.5 c cm in the cases of primiparæ and 1.0 c cm in the cases of multiparæ. During the first stage not more than 0.5 c cm should be given. When thymophysin is used in preparation for cesarean section in cases of overdue labor it has the advantage of dilating the lower segment of the uterus and the cervix so that a low section can be performed and brings the patient to operation with good uterine contractions. In cases in which section is to be done after rupture of the membranes it is indicated especially to lessen contamination of the uterine cavity and facilitate low section. For such cases the author recommends giving a dose of 0.5 c cm while preparations are being made and 0.5 c cm more five minutes before the operation is begun.

2. Primary inertia. In this condition thymophysin will act only if the retractability of the uterus is not impaired. It is therefore contra-indicated in cases of hyperdistention of the uterus such as hydramnios and multiple pregnancies. If primary inertia is recognized early and 0.5 c cm of thymophysin or less is given promptly and repeated as often as necessary the initial disturbance will be corrected, the period of dilatation shortened, and the use of forceps will be rendered unnecessary by the prevention of fatigue and hypertonicity of the uterus during the second stage. By shortening the duration of labor and rendering the application of forceps unnecessary it decreases the danger of cerebral hæmorrhage in the child and of injury to the genital tract of the mother. It will also decrease the psychic trauma of prolonged labor with interference, which is manifested later by frigidity during coitus, dyspareunia, amenorrhœa, and dysmenorrhœa. In cases of rupture of the membranes with primary inertia, thymophysin should be used promptly, before intra-uterine infection sets in.

3. Eclampsia. The author believes that thymophysin is indicated in cases of eclampsia in which it is too late for cesarean section and the head is not low enough for the application of forceps.

In conclusion the author says that during the expulsive period thymophysin is not much superior to pituitrin.

W. H. MARTINEZ, M. D.

Danforth, W. C. The Treatment of Occiput-Posterior Positions, with Especial Reference to Manual Rotation. *Am. J. Obst. & Gynec.*, 1932, **XXII**, 360.

This report is based on 256 right and 29 left occiput-posterior presentations. Good obstetrical strategy demands that the woman be gotten into the second stage with her physical powers as nearly intact as possible and with minimal impairment of her nervous forces. Accordingly the judicious use of some form of opiate is often of value.

Dilatation should occur by the normal mechanism. Interference to hasten it should usually be avoided. In carefully chosen cases, however, it may be completed manually or by Dührssen's incisions.

In 65.4 per cent of the cases reviewed delivery occurred spontaneously or was effected by the application of forceps at the outlet.

If failure of anterior rotation occurs, or if the head rotates anteriorly only part way, the following method of manual rotation is employed.

After waiting for the head to become engaged and for any necessary moulding to occur, the right hand is introduced and the head grasped with the fingers and thumb which are spread out so that the force used will be distributed over the fetal head as widely as possible. At the same time the left hand is applied to the mother's lower flank, as nearly as possible under the fetal shoulder. Simultaneously the hand within the vagina, which is grasping the head, and the external hand rotate the head and the body. For success in this maneuver it is necessary for the uterine musculature to be relaxed with ether. If possible, the head is overcorrected.

The thumb of the internal (right) hand is then withdrawn, the tips of the fingers being left in contact with the lower part of the child's face in order to prevent backward rotation into the original position. At this point the operator's left hand leaves the abdomen of the mother and is replaced by the hand of an assistant or nurse. The replacing hand may be applied under the sterile sheets without disturbing asepsis. The left blade of the forceps is then introduced by the operator with his left hand, the blade being passed inside the fingers of the right hand which still remains in place. After the introduction of this blade an assistant holds the handle and at the same time exerts gentle traction laterally. In this way a gentle lever action is produced, the blade of the forceps causing pressure against the child's head instead of the operator's hand, thus hindering backward rotation. The right blade is then introduced and the blades are closed. With 1 or 2 fingers the operator assures himself that the occiput remains anterior. Extraction may then be done.

This procedure was carried out in 76 of the cases reviewed. In 9 it was attempted but failed and version was done at once. In 8 cases version was done without any attempt at manual rotation. In 104 cases simple outlet forceps were used, after

spontaneous rotation. There were no maternal deaths.

Any woman whose temperature rose to 100.4 degrees F at any time was included in the morbidity list. Such a rise in the temperature occurred in 10 cases after manual rotation, its incidence being therefore 15.1 per cent.

In the discussion of this report HILLIS said that although manual rotation is the procedure of choice in cases of occiput-posterior position, a substitute for it is needed. Such a substitute is the use of the Kjelland forceps.

COWELL called attention to a method of rotating the posterior head which he has found useful. He fits the fingers into the upper lambdoid suture and, with the palm, pushes the occiput forward in an upward circular manner toward the pubis, using the lambdoid suture as a lever. In this way rotation is often accomplished easily.

HOLMES stated that while the Scarsdale maneuver is sometimes absolutely necessary manual correction is usually far superior and much safer.

E. L. COWELL, M.D.

#### PUERPERIUM AND ITS COMPLICATIONS

Zocchi, E.: The Permeability and Resistance of the Capillaries in the Normal and Pathological Puerperium (*Ricerche sulla permeabilità sulla resistenza dei capillari nel puerperio normale patologico*). *Folia gynecol.* 1935 xrviii 505

The author reviews the literature and reports his findings in fifty cases in which the puerperium was normal and thirty-two cases in which it was abnormal.

In studying the permeability of the capillaries he used Petersen's method. A cantharides plaster was applied over 3 sq. cm. of the outer surface of the thigh for six hours. After the vesicle had reached certain size it was punctured and the fluid caught in sterile test tubes. A little blood taken at the bend of the elbow and the serum from the vesicle were then examined with the refractometer with the use of *Rabe's* table.

To determine the resistance of the capillaries, an elastic ligature not tight enough to stop the arterial pulse was placed around the arm three or four fingerbreadths above the elbow for five minutes. If this test was positive punctate hemorrhages about the size of pinheads appeared below the ligature. The distance they extended from the ligature determined the degree of postthrombosis. To determine whether there was any relation between this endothelial sign and the arterial pressure, measurements of the maximum and minimum arterial pressure were made.

It was found that in the normal puerperium the permeability of the capillaries remains low except on the second and third days and the endothelial sign is always negative. In the pathological puerperium the permeability of the capillaries is always high and is highest in the serious and fatal cases. It is

therefore of value in the prognosis. While the endothelial sign appears during high fever it has no relation to either the course of the disease or the seriousness of the infection.

Zocchi believes that the changes in the function of the capillaries may be due partly to irritation caused by products of metabolism and partly to reflexes from the sympathetic nervous system.

ARMANDO GOMI MONDINI, M.D.

#### MISCELLANEOUS

Benhamou E., and Nouchy A.: The Blood Platelets in the Course of Menstruation, Pregnancy and the Puerperium (*Les plaquettes sanguines au cours de la menstruation, de la grossesse et des suites de couches*). *Gynec. et obst.*, 1935 xxv 97

The authors studied the blood platelets in the course of menstruation and the menopause, after the injection of folliculin, and during pregnancy, labor, and the puerperium. They used the Van Haverdonk-Van Goidtsenhoven technique modified by the addition of brilliant crystal blue to the dilution fluid. They state that if the digestive periods are considered and blood samples are taken at the same hour in the morning with the subject fasting, the results will be constant and comparable with each other. In the normal woman the average number of platelets oscillates between 330,000 and 380,000.

Menstruation is always accompanied by a decrease in the number of platelets. The decrease may be sudden, occurring immediately before menstruation, or gradual.

Injections of folliculin do not seem to provoke great variations in the number of platelets and never cause an increase.

The menopause has little effect on the platelets.

Pregnancy is generally accompanied by a distinct and progressive increase in the number of platelets. At the end of pregnancy the number oscillates between 500,000 and 600,000. This increase is one of the factors in the biological diagnosis of pregnancy.

In the course of labor a decrease in the number of platelets begins, and after delivery the decrease becomes more marked.

In the course of the puerperium the number of platelets begins almost imperceptibly to increase until by the eighth or ninth day the number is normal.

PAGE

Bourg, R. Biological and Clinical Study of Hydatid Mole and Chorionepithelioma (*Etude biologique et clinique de la mole hydatique et du chorionépithéliome*). *Rev. franç. de gynéc. et d'obst.*, 1935 xrviii 1

The recent demonstration of prolan or gravidia in the body fluids of pregnant women represents a valuable contribution to our knowledge of hydatid mole and chorionepithelioma from both the biological and the clinical point of view.

The anatomopathological examination, which is of value only as supplement to clinical examination, has been generally regarded as of no aid in re-

vealing the benign or malignant character of a mole. The diagnosis of the condition has been based chiefly on the coexistence of three cardinal signs—hæmorrhage, toxæmia, and excessive size of the uterus in relation to the stage of the pregnancy.

Aschheim and others have shown that the Aschheim-Zondek reaction is positive in the presence of a mole, and Fels, Otto, and others have found it positive also in cases of chorionepithelioma. In mole the reaction is from five to ten times as strong as in normal pregnancy. In chorionepithelioma the content of prolactin in the urine is greater than in normal pregnancy, but not so great as in mole. According to Zondek, a diagnosis of mole may be considered confirmed if the female mouse gives a positive reaction to 0.005 c.c.m. of urine, which corresponds to a concentration of about 200,000 mouse units of the active substance per liter of urine. In normal pregnancy the concentration varies from 5,000 to 30,000 mouse units per liter.

Bourg draws the following conclusions:

1. A reaction which is very marked or is obtained with very dilute urine suggests hydatid mole or chorionepithelioma.

2. A positive reaction confirms a diagnosis of chorionepithelioma based on clinical findings or on the scrapings of curettage.

3. In cases of testicular tumor a positive reaction will permit the diagnosis of chorionepithelioma before anatomical examination.

4. A normal pregnancy reaction does not rule out the possibility of mole.

5. Especially in cases of old pregnancy which has passed term by several months, a negative reaction does not entirely exclude mole. The character of the reaction in these cases may be explained by degeneration of the molar tissue or the interposition of a thick layer of fibrin between the vesicles and the uterine mucosa.

The reaction is of value also from the therapeutic standpoint. A positive reaction fifteen days after curettage suggests that the curettage was not complete and that molar vesicles are retained. However, the result of this biological test does not permit exclusion of a perforating mole or malignant degeneration of elements remaining in the uterus. After normal pregnancy the reaction remains positive for from three to eight days. In cases of hydatid mole without malignant change it may remain positive for from ten days to several months after complete evacuation of the uterus. According to the majority of reports, however, the active substance disappears within fifteen days. Therefore a reaction remaining strongly positive after fifteen days is to be regarded as an indication for renewed examination of the uterus and possibly for hysterectomy. The clinical findings must also be considered. The clinical indications for hysterectomy are insufficient involution of the uterus, irregularity of the uterine walls, and a bloody or purulent oozing from the cervix.

A reaction remaining strongly positive one or more months after curettage indicates that prolif-

erating molar vesicles still remain in the uterus or have given rise to a chorionepithelioma.

The late reappearance of a positive reaction after one or more negative reactions in the absence of a new pregnancy indicates that tiny rests have given rise to a recurrence or a chorionepithelioma.

A persistently negative reaction excludes the development of mole with or without associated ovarian cyst formation. However, it does not exclude the possibility of prolonged retention of molar vesicles or of a degenerated or degenerating chorionepithelioma in the uterus or its walls.

Metastases from chorionepithelioma will give a positive reaction like that produced by the primary tumor. Therefore an early diagnosis of metastases is possible.

In the determination of the prognosis of chorionepithelioma a series of biological tests will give better information than the histological findings. In a case reported by Falbusch in which the anatomopathological findings indicated chorionepithelioma, but the tests were repeatedly negative, complete recovery followed curettage, and in one of the author's cases in which the reaction was negative a few days after curettage and negative before hysterectomy operation revealed chorionepitheliomatous tissue in the submucosa in a state of regression or hyaline degeneration.

Two theories have been advanced to explain the production of a substance peculiar to pregnancy, but as yet it is impossible to determine which is correct. Zondek and Aschheim believe that prolactin has its origin in the anterior lobe of the pituitary gland, whereas Philipp, Fels, Klein, and Bourg believe it is produced by the placenta. During pregnancy it is present in the placenta, but not in the anterior lobe of the pituitary gland. Reichert and Evans have shown that, in contrast to pituitary extract, prolactin in large doses or given over a considerable period of time has no effect on hypophysectomized dogs or rats. The placenta excretes prolactin. In mole and chorionepithelioma the pituitary changes are the same as those seen in normal pregnancy. It appears that mole and chorionepithelioma secrete prolactin like the placenta and do not represent mere reservoirs where prolactin is accumulated after being secreted by the anterior lobe of the pituitary gland. Moreover, chorionepitheliomatous tissue in active proliferation, whether it is of testicular or ovarian origin, will always, upon implantation, give a positive reaction. It therefore contains the active substance and contains it in much greater quantities than the normal placenta.

Nevertheless it is certain that pathological chorionic tissue no longer secretes prolactin when it begins to degenerate. This explains why negative reactions are obtained in some cases. As the decidual reaction is usually slight in mole and chorionepithelioma, it is unlikely that this reaction has any part in the production of prolactin in these conditions.

The injection of prolactin into female animals produces two types of reaction in the ovaries. In mice

spontaneous rotation. There were no maternal deaths.

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CORSELL called attention to a method of rotating the posterior head which he has found useful. He fits the fingers into the upper lambdoid suture and, with the palm, pushes the occiput forward in an upward circular manner toward the pubis, using the lambdoid suture as a lever. In this way rotation is often accomplished easily.

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E. L. CORSELL, M.D.

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ARMANDO GOMI MORENO, M.D.

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# GENITO-URINARY SURGERY

## ADRENAL, KIDNEY, AND URETER

Goldzieher, M. A., and Gordon, M. B. The Syndrome of Adrenal Haemorrhage in the New-born. *Endocrinology*, 1932, xvi, 165

The authors have collected thirty-seven cases of adrenal haemorrhage in the newborn. They report six cases and review thirty-eight cases of adrenal haemorrhage in older infants.

They believe that the diagnosis of adrenal haemorrhage in the newborn may be made on the basis of two groups of symptoms: (1) acute insufficiency of the adrenals, which is associated with a high temperature, rapid respiration, a petechial or purpuric rash, cyanosis, metabolic changes manifested usually by hypoglycaemia, and sometimes gastro-intestinal and nervous disturbances, and (2) intra-abdominal haemorrhage with its accompanying signs and symptoms. The prognosis is poor.

The treatment suggested consists of blood transfusion, injections of glucose, and the administration of a potent extract of the adrenal cortex.

DONALD K. HIBBS, M.D.

Johnson, C. M. The Pathogenesis of Hydronephrosis. *J. Urol.*, 1932, xxvii, 279

In order to follow the changes which occur in the renal tubules in progressive hydronephrosis, Johnson ligated and divided the left ureter at the uretero-pelvic junction in a number of young normal rabbits, sacrificed the animals after intervals of one, two, three, five, and eight months, and then studied the tubules by dissection according to the maceration method of Huber.

He found that dilatation began in the glomeruli and convoluted tubules and soon involved the papillary ducts. At the end of a month, atrophy began in the glomeruli and the proximal convoluted tubules. Thereafter, atrophy of the secretory portion of the kidney continued with progressive dilatation of the collecting ducts. At the end of three months some of the glomeruli communicated directly with the collecting tubules as the result of shortening, straightening, and disappearance of the convoluted tubules. At the end of five months this communication was entirely lost and there was maximum dilatation of the collecting tubules. Thereafter, gradual atrophy and shrinkage in all dimensions took place.

THEODORE P. GRAUER, M.D.

Simons, I. The Surgical Treatment of Nephritis. *J. Urol.*, 1932, xxvii, 399

In acute and chronic Bright's disease surgery is indicated when the clinical picture is dominated by one or more of the following symptoms or signs: (1) severe renal pain, (2) massive renal haemorrhage,

(3) the oliguria-anuria-uraemia syndrome, and (4) any of these symptoms or signs associated with anasarca.

A very careful and complete urological study is necessary to rule out conditions such as renal tuberculosis with haemorrhage, calculous anuria, neoplasm of the kidney or its pelvis, and other conditions which are not true Bright's disease.

Simons includes in his discussion several pyogenic conditions of haematogenous origin which are similar to Bright's disease.

Most of the conditions to be considered surgical belong to the groups known as: (1) acute diffuse glomerulonephritis, (2) chronic diffuse glomerulonephritis, (3) the kidney of pregnancy and eclampsia, (4) necrotic nephroses (caused by metallic poisons, etc.), (5) lipoid nephroses, (6) embolic purulent nephritis, and (7) focal and unilateral nephritis.

In the treatment of these conditions semisurgical procedures such as lavage of the renal pelvis have a place. In selected cases, renal decapsulation, nephropexy, nephrotomy, or nephrectomy may be indicated.

The author presents tables of cases reported in the literature in the period from 1920 to 1930. This decade was selected because it was recent, it was a period in which careful urological study of renal conditions was becoming more general, it was far enough removed from the period of over-enthusiasm for renal surgery, particularly decapsulation, and it followed the adoption of the more modern pathological classification of nephritis. The statistics are suggestive although the number of cases is not large and undoubtedly many cases with a doubtful and unfavorable outcome were not recorded in the literature. As surgical intervention cannot cure the underlying nephritis in acute renal collapse with ascites and anuria, the use of the word "cure" in the tables means only that the extreme condition was relieved. While in many cases the urine remained somewhat pathological for some time after the operation or even as long as the case was followed, the patients left the hospital with a new lease on life. C. TRAVERS STEPTA, M.D.

Brady, L. Carbuncle of the Kidney (Metastatic Staphylococcus Abscess of the Kidney Cortex). *J. Urol.*, 1932, xxvii, 295

To the eighty-seven cases of carbuncle of the kidney which have been reported in the literature to date the author adds a case of his own. The condition occurs most frequently between the ages of twenty and forty years. The two youngest patients were ten years old. Both recovered after operation. The oldest patient was a man of fifty-six years. Fifty-four of the patients were males. In the



and rats false corpora lutea are formed at the expense of the theca interna of follicles which do not become cystic. The process represents a new method of induced atresia of the ovarian follicle. In cats, the injection of prolan is followed by the formation of follicular cysts accompanied by lutein transformation of the granulosa which hypertrophies becoming fatty and vascular.

The ovaries of women with hydatid mole or chorionepithelioma react to the abnormal amount of prolan in the blood by developing into a polycystic mass which frequently assumes voluminous proportions.

There is no polycystic reaction of the ovaries after the mole or chorionepithelioma has begun to degenerate. In cases of chorionepithelioma of the testicle an important hypertrophic reaction of the prostate and seminal vesicles occurs and the urine contains large quantities of prolan. When the mole is cured by an intervention, the cysts regress spontaneously and progressively and the amount of prolan in the body fluids diminishes. If the mole degenerates into

a chorionepithelioma the cystic lesions progress, finally drawing the attention of the clinician.

These biological findings explain and confirm the classical opinion of the probability of malignant degeneration of the mole when ovarian cysts develop or progress after its evacuation.

Prolan injected into female animals may cause cystic changes in the ovaries. The changes in the ovary depend upon the quantity of the substance injected and the duration of its action and upon the species, functional state, and age of the animal used. Experiments on cats suggested that the follicular fluid in the induced cysts should contain folliculin in large amounts. Like Otto and Roessler the author was able to demonstrate the presence of prolan in the ovarian cysts of a patient. He believes it probable that this substance is derived from the transudation of serum through the vessels of the theca. The cystic fluid also contains fibrin. Bourg was unable to determine whether the liquid in the follicular cysts contained folliculin in an appreciable quantity.

Ernest S. Moore

wound through a rubber drainage tube, the carbuncle was kept constantly bathed with a solution containing a staphylococcal bacteriophage

Non-operative treatment appears never justified in carbuncle of the kidney

C TRAVERS STEPITA, M D

Mackenzie, D W, and Ratner, M Metastatic Growths of the Ureter *Brit J Urol*, 1932, 14, 27

The authors apply the term "metastatic growth" only to secondary lesions produced by way of the lymphatics or blood vessels. They state that although there are numerous communications between the lymphatics of the pelvis and the ureter, metastatic growths in the ureter are extremely rare. The first metastatic growth in the ureter to be described was reported by Giordano and Bumpus in 1922. Regnier reported a case in 1924 and Rathbun a case in 1929. In this article the authors report three cases. In the first case, that of a negro, there was a carcinoma of the prostate with metastases in both ureters, obstruction of the right ureter, and pyonephrosis of the right kidney. In the second case, that of a white male, there was a scirrhous carcinoma of the stomach with a metastasis in the right ureter and pyonephrosis of the right kidney. In the third case, that of a white female, there was a carcinoma of the cervix uteri with obstruction of the left ureter and pyonephrosis of the left kidney.

GILBERT J THOMAS, M D

## BLADDER, URETHRA, AND PENIS

Gunsett, A Roentgen Therapy of Cancer of the Bladder by the Fractional Dosage Method (La roentgenothérapie du cancer de la vessie par la méthode de la dose fractionnée) *Acta radiol*, 1932, xiii, 1

The author reviews twenty-six cases of cancer of the bladder treated by him during the period from 1922 to 1929. Beginning with the second case in 1922, the treatment consisted of roentgen irradiation applied in divided doses over a period of about three weeks. In the first case treated in 1922 a single application—128 per cent of the erythema dose—was given, but was distributed over five days. After 1924 the dosage was effected with the aid of Solomon's ionometer from 4,000 to 5,000 r being given in the course of three weeks. The filter was 1 mm of zinc or copper (later 2 mm of copper) plus 2 mm of aluminum and the distance was 30 cm. Some of the cases were treated with roentgen irradiation alone. In others the roentgen treatment was either preceded or followed by electrocoagulation.

Of the twenty-six patients ten were still alive and free from symptoms at the beginning of 1932. The years in which these patients were treated were as follows: one, 1922; one, 1923; two, 1924; two, 1925; one, 1926; two, 1928; and one, 1929. Therefore, of nineteen patients treated more than five years ago, 8 (42 per cent) still remain healed.

The author expresses the opinion that the treatment of extensive bladder tumors should begin with deep roentgen therapy and that electrocoagulation should be employed rather as a means of destroying such portions of the growth as may still remain after the roentgen treatment. In certain cases, however, roentgen treatment may be used after electrocoagulation when the latter has given an unsatisfactory result.

## GENITAL ORGANS

Hellstadius, A Urea-Tolerance Tests in Prostatic Hypertrophy (Harnstoff-Belastungsproben bei Prostata-Hypertrophien) *Acta chirurg Scand*, 1932, lxi, 339

The author made urea-tolerance tests in determining the efficiency of the kidneys in cases of hypertrophy of the prostate gland in order to obtain information regarding the capacity of the kidneys to excrete urea in cases in which the non-protein nitrogen in the blood is not markedly increased.

In comparing the results of the urea-tolerance and the water tests a certain agreement was noted between the two, but in some cases there was an obvious discrepancy. Therefore it may be of advantage, at least in doubtful cases, to carry out a urea-tolerance test in addition to the water test. There is no reason to conclude that the uric acid in the blood will increase earlier than the non-protein nitrogen in beginning renal inefficiency, at least not so far as can be ascertained by the urea-tolerance test.

Turner, B W The Surgical Problem of Epididymitis and Vasitis *J Urol*, 1932, xxvi, 359

The author presents an operation for the relief of epididymitis not heretofore described in the literature.

The Hagner operation and its modifications is not sufficient to cope with all types of the condition. Other methods are merely palliative and are often followed by destruction of the testicle due to sclerosis of the epididymis, the formation of a nodule in the vas funicular adhesions, or obliterative seminal vesiculitis. Diathermy also may destroy the function of the testicle as it favors scarring and obliteration of the epididymis, vas, and blood vessels. Epididymectomy has been performed too often for want of a better procedure to give relief. It is indicated only by tuberculosis and fibrous occlusion of the entire epididymis with pain in the testicle.

There are two types of epididymitis—simple epididymitis and panepididymitis. Both may be acute or chronic.

In 75 per cent of the cases of simple epididymitis only the tail of the epididymis is involved. For this condition the Hagner operation is sufficient.

In panepididymitis, the entire epididymis, the vas deferens and the funiculus are affected. In some cases the involvement may extend from the

reports of thirteen cases the sex was not recorded. The greater susceptibility of males, especially middle-aged males, to carbuncle of the kidney may be due to the fact that not infrequently in males there is back pressure on the kidney due to obstruction in the region of the prostate or the lower urinary tract which reduces the resistance of the renal cortex to infection. There is little difference in the frequency of involvement of the two kidneys. In only three cases on record were both kidneys involved. Two of the three patients with bilateral carbuncle died. They were the oldest patients, one being fifty-six and the other fifty-five years of age.

Carbuncle of the kidney is caused by a metastatic staphylococcal infection which very frequently is limited to the renal cortex. The pelvis of the kidney is not involved. As a rule the infection is secondary to a furuncle, abscess, or carbuncle of the skin or subcutaneous tissue. Occasionally however the carbuncle develops immediately after an acute respiratory infection, as in the case reported by the author.

The typical carbuncle is made up of many small suppurating areas, some of which are of pinpoint size. The whole lesion is separated from the rest of the kidney by a definite ring of inflammatory tissue. Toward the center of the carbuncle there is sometimes a soft necrotic area in which the individual small abscesses have coalesced and therefore can no longer be recognized.

In addition to these typical carbuncles there are found from time to time inflammatory lesions limited to the renal cortex which are of metastatic origin and are caused by the staphylococcus but do not show several points of suppuration although they have necrotic centers and walls of inflammatory tissue separating them from the rest of the kidney. These lesions have been called metastatic staphylococcal abscesses of the renal cortex. By some, notably Smrow they are differentiated from carbuncle.

Acute septic or embolic kidney, a condition in which the entire organ is studded with small abscesses, presents a very different pathological picture from that of carbuncle. Cases of pyelonephritis are characterized clinically by the presence of large quantities of pus in the urine.

Descriptions of carbuncle of the kidney have varied according to whether operation was performed early or late. The lesion starts in the kidney cortex, but soon extends to the fibrous capsule. Often there is penetration of the capsule with involvement of the fatty capsule and the formation of a perinephritic abscess. The fibrous capsule is usually found to be firmly adherent to the kidney in the region of the carbuncle, and both capsules are apt to be greatly thickened. The kidney is generally somewhat enlarged. The carbuncle varies in shape. On cross-section it often appears to be triangular with the apex of the triangle pointing toward the pelvis of the kidney. In Israel's case it appeared to be raised from the surface of the rest of

the renal cortex so that it suggested a renal tumor. Often there is a fistula leading from the carbuncle into an infected perinephritic cavity. According to some urologists, all perinephritic abscesses develop from carbuncles and therefore in all operations for perinephritic abscess the surgeon should inspect the kidney carefully for cortical suppuration.

Microscopic sections of a kidney carbuncle show lymphocytes, plasma cells, and polymorphonuclear leucocytes. Staphylococci can generally be seen scattered through the tissues. It is often possible to recognize the individual minute abscesses by the strands of connective tissue separating them from each other.

It is not clearly understood why in children, pyogenic infections of the skin and subcutaneous tissues metastasize to the bones and cause osteomyelitis whereas, in adults, they form metastatic lesions in the soft parts and particularly in the kidneys. The ability of the staphylococcus to get a better foothold in the renal cortex than any other pyogenic organisms has been attributed to its ability to break down urea and use the split products for its maintenance.

The diagnosis of the cortical lesions under discussion is rendered difficult by the absence of bladder symptoms and the fact that the cystoscopic appearance of the bladder and ureteral orifices shows no characteristic changes. However differential palpation is of aid as there is a delay in the appearance of the dye from the affected side and the excretion of phthalein from the involved kidney is less than the excretion from the other kidney. A pyelogram may be helpful by revealing a filling defect due to the pressure of the carbuncle on the pelvis, a picture not unlike that produced by a neoplasm. The ureter of the involved kidney may show changes such as dilatation or kinking.

In the cases of patients with a history of recent boil, carbuncle, or other staphylococcal infection and with pain in one flank, a high septic temperature, definite tenderness under one costal margin, and urine containing little or no pus, the diagnosis of carbuncle of the kidney can frequently be made early.

Renal carbuncles are most frequent at the renal poles, especially the upper pole. Operation is indicated as soon as the diagnosis is made, but there has been a great difference of opinion as to what procedure should be adopted. Many surgeons strongly urge nephrectomy in all cases of renal carbuncle whereas others believe that the kidney should be saved whenever possible. Conservative operation has usually consisted of incision into the carbuncle and drainage, but in a few instances other operations have been employed, such as excision of the portion of the kidney containing the carbuncle or enucleation with the finger. In the author's case excision was impossible because of the size of the carbuncle. Therefore the kidney capsule was incised throughout its length and drains were placed down to the carbuncle. After the operation by irrigating the

wound through a rubber drainage tube, the carbuncle was kept constantly bathed with a solution containing a staphylococcal bacteriophage

Non-operative treatment appears never justified in carbuncle of the kidney

C TRAVERS STEPITA, M D

Mackenzie, D W., and Ratner, M Metastatic Growths of the Ureter *Brit J Urol*, 1932, 11, 27

The authors apply the term "metastatic growth" only to secondary lesions produced by way of the lymphatics or blood vessels. They state that although there are numerous communications between the lymphatics of the pelvis and the ureter, metastatic growths in the ureter are extremely rare. The first metastatic growth in the ureter to be described was reported by Giordano and Bumpus in 1922. Regnier reported a case in 1924 and Rathbun a case in 1929. In this article the authors report three cases. In the first case, that of a negro, there was a carcinoma of the prostate with metastases in both ureters, obstruction of the right ureter, and pyonephrosis of the right kidney. In the second case, that of a white male, there was a scirrhus carcinoma of the stomach with a metastasis in the right ureter and pyonephrosis of the right kidney. In the third case, that of a white female, there was a carcinoma of the cervix uteri with obstruction of the left ureter and pyonephrosis of the left kidney.

GILBERT J THOMAS, M D

## BLADDER, URETHRA, AND PENIS

Gunsett, A Roentgen Therapy of Cancer of the Bladder by the Fractional Dosage Method (La roentgenothérapie du cancer de la vessie par la méthode de la dose fractionnée) *Acta radiol*, 1932, 11, 1

The author reviews twenty-six cases of cancer of the bladder treated by him during the period from 1922 to 1929. Beginning with the second case in 1922, the treatment consisted of roentgen irradiation applied in divided doses over a period of about three weeks. In the first case treated in 1922 a single application—128 per cent of the erythema dose—was given, but was distributed over five days. After 1924 the dosage was effected with the aid of Solomon's ionometer from 4,000 to 5,000 r being given in the course of three weeks. The filter was 1 mm of zinc or copper (later 2 mm of copper) plus 2 mm of aluminum, and the distance was 40 cm. Some of the cases were treated with roentgen irradiation alone. In others the roentgen treatment was either preceded or followed by electrocoagulation.

Of the twenty-six patients ten were still alive and free from symptoms at the beginning of 1932. The years in which these patients were treated were as follows: one, 1922, one, 1923, two, 1924, two, 1925, one, 1926, two, 1928, and one, 1929. Therefore, of nineteen patients treated more than five years ago, 8 (42 per cent) still remain healed.

The author expresses the opinion that the treatment of extensive bladder tumors should begin with deep roentgen therapy and that electrocoagulation should be employed rather as a means of destroying such portions of the growth as may still remain after the roentgen treatment. In certain cases, however, roentgen treatment may be used after electrocoagulation when the latter has given an unsatisfactory result.

## GENITAL ORGANS

Hellstadius, A Urea-Tolerance Tests in Prostatic Hypertrophy (Harnstoff-Belastungsproben bei Prostata-Hypertrophien) *Acta chirurg Scand*, 1932, 119, 339

The author made urea-tolerance tests in determining the efficiency of the kidneys in cases of hypertrophy of the prostate gland in order to obtain information regarding the capacity of the kidneys to excrete urea in cases in which the non-protein nitrogen in the blood is not markedly increased.

In comparing the results of the urea-tolerance and the water tests a certain agreement was noted between the two, but in some cases there was an obvious discrepancy. Therefore it may be of advantage, at least in doubtful cases, to carry out a urea-tolerance test in addition to the water test. There is no reason to conclude that the uric acid in the blood will increase earlier than the non-protein nitrogen in beginning renal inefficiency, at least not so far as can be ascertained by the urea-tolerance test.

Turner, B W The Surgical Problem of Epididymitis and Vaginitis *J Urol*, 1932, 27, 359

The author presents an operation for the relief of epididymitis not heretofore described in the literature.

The Hagner operation and its modifications is not sufficient to cope with all types of the condition. Other methods are merely palliative and are often followed by destruction of the testicle due to sclerosis of the epididymis, the formation of a nodule in the vas funicular adhesions, or obliterative seminal vesiculitis. Diathermy also may destroy the function of the testicle as it favors scarring and obliteration of the epididymis, vas, and blood vessels. Epididymectomy has been performed too often for want of a better procedure to give relief. It is indicated only by tuberculosis and fibrous occlusion of the entire epididymis with pain in the testicle.

There are two types of epididymitis—simple epididymitis and panepididymitis. Both may be acute or chronic.

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In panepididymitis, the entire epididymis, the vas deferens, and the funiculus are affected. In some cases the involvement may extend from the

tall of the epididymis to the seminal vesicle, giving rise to a complicated series of pathological entities.

The operation for panepididymitis is performed as a rule under local anesthesia. The entire epididymis and a in. of the cord are exposed by a lateral incision made on the outer surface of the scrotum. Adhesions are then freed and the cord is separated from its bed. At the junction of the cord and testicle the sheath is divided and peeled up to release the resistance of the tissues. On exposure of the vas, a nick is made and the proximal lumen is catheterized with a strand of silk worm gut. If the vas is patent to the seminal vesicle and no pus exudes, the sheath is closed with a simple catgut suture. If pus is found or hyperplasia of the vas is present, the silk worm gut is left in place for about three days with its end anchored to the skin at the upper angle of the wound.

If an accumulation of fibrous exudate has formed in the tunica, the next step in the operation consists in exposing the hydrocoele sac. The tunica vaginalis is opened by a longitudinal incision made over the central part of the testicle at a point opposite the epididymis and is then allowed to retract. No trimming is done and no bottle operation is attempted. An incision is made laterally over the entire epididymis and the sheath separated by blunt dissection.

The chief object of the operation is to relieve the pressure by incising the sheath of the epididymis. However irrespective of the location of any abscess found, the entire epididymis is opened at this stage of the procedure and the tubules are liberated. In this way drainage is established and the danger of extension of the infection is reduced. A small rubber tissue drain is sewed in with its ends brought out at the upper and lower angles of the wound.

This operation, which adds drainage to all parts, is indicated for most cases of panepididymitis heretofore considered hopeless without radical surgical removal.

In cases of sterility the complicated anastomosis of the epididymis to the vas may be replaced to advantage by bold incision through the longitudinal axis of the fibrous epididymis and the introduction of a drain combined, when indicated, with excision of a nodule in the vas and end-to-end anastomosis over silk worm gut. C. TRAVES STORCA, M.D.

### MISCELLANEOUS

Cowley D. M., and Ellick, W. C.: Observations on the Bacteriophage. III. The Treatment of Colon Bacillus Infections of the Urinary Tract by Means of Subcutaneous and Intravascular Injections of Bacteriophage Filtrates. Detailed Case Reports. Methods for Preparation of Filtrate. *J Lab & Clin Med* 93 xvii, 681.

The treatment and progress of forty-six cases of infection of the urinary tract due to one or more strains of the colon bacillus and of one case of

infection due to the bacillus typhosus are reported. The cases were not selected. In the treatment of such cases it is important to determine whether the infection is acute, acute recurrent, or chronic. The different types of infection do not respond to bacteriophage treatment in the same way. A case of recent development would be expected to respond more promptly than a chronic case.

It is not possible to develop a suitable polyvalent stock bacteriophage filtrate for the treatment of colon bacillus infections of the urinary tract. A filtrate which is potent against the bacillus cell in one case and may have taken many weeks to develop may have no lytic effect on an organism isolated from another patient. On the other hand, a filtrate for the second patient may be developed from a sewage base or a stock bacteriophage in a few days. All bacteriophage filtrates are polyvalent in the sense that they are lytic for several organisms, particularly old laboratory strains. The potency of a bacteriophage may always be increased from a sewage base or stock filtrates. The chief problem is the adaptation of the bacteriophage to the case strain. In apparently resistant cases recovery will result if laboratory efforts are continued long enough. In long standing cases the bacteriophage is beneficial even though the organism cannot be entirely eliminated. In acute cases a satisfactory filtrate is obtained in from one to twelve days. It is common for one strain or colony type to be apparently changed to another—for a sensitive type to be changed to a resistant type. As time is saved by rendering the urine alkaline, alkalification of the urine is an essential part of the treatment. It is valuable also because of the probability of the development of an antibacteriophage.

Bacteriophage filtrates may be administered subcutaneously intravenously or by the use of a ureteral catheter. These methods may be used singly or combined. When the filtrate is given by subcutaneous injection small doses are definitely more effective than large doses. Two or three cubic centimeters should be injected on alternate days until three doses have been given. The combined subcutaneous and intravascular method is preferable. In cases of cystitis alone, the intravascular method is most efficacious. Flushing the renal pelvis has no special advantage. When bladder instillations are given the water intake should be reduced for five or six hours after the instillation in order that the filtrate may be retained as long as possible.

The severity of the reaction is proportional to the amount of protein in the filtrate. A filtrate developed in broth may have a higher potency than a filtrate developed on hard media which contains less protein. The reactions are usually of the type of non-specific protein reactions, but a specific reaction occurs if the patient becomes sensitized to proteins contained in the filtrate. The reactions may be so severe that one may question the advisability of continuing the treatment until a more

satisfactory filtrate is obtained. A filtrate causing a marked reaction in one patient may have no effect on another patient. One series of injections will not interfere with lysis of the bacillus coli by a subsequent series whether the latter are given after a long or a short interval. No bacteriophagocidal antibodies develop after inoculation with bacteriophage filtrate. As a rule the disappearance of pus or increased cells in the urine precedes or occurs simultaneously with disappearance of the bacillus coli. On discharge, all patients should be told to continue the alkalinization.

The methods for developing the bacteriophage filtrate are described in detail.

The following conclusions are drawn:

1 In colon bacillus infections of the urinary passages bacteriophage inoculation is an effective method of treatment.

2 Its success depends upon careful adaptation of the bacteriophage corpuscles to the strains of bacillus coli responsible for the infection, careful preparation of the patient by alkalinization, and continuance of the alkalinization for some time after the urine has become sterile.

3 The patient's comfort depends upon reducing the protein content of the filtrate to the minimum. Water-clear filtrates cause little or no reaction. Colored filtrates almost invariably cause undesirable reactions. The latter are more likely to occur in adults than in young children.

4 Recent bacillus coli infections are usually terminated quite promptly by bacteriophage inoculation.

5 Chronic bacillus coli infections are more resistant. It is often more difficult to develop a satisfactory filtrate for such infections.

6 One course of inoculations does not interfere with the effectiveness of subsequent inoculations.

7 Long standing infections may often be terminated or greatly improved by bacteriophage inoculation. It appears that if a bacteriophage causing lysis of the organism *in vitro* can be developed sterilization will occur no matter how resistant the strain or how long the infection has been present.

8 Apparently no immunity to subsequent attacks is produced by bacteriophage sterilization of the urinary tract.

LOUIS NEUWELT, M.D.

# SURGERY OF THE BONES, JOINTS, MUSCLES, TENDONS

## CONDITIONS OF THE BONES JOINTS MUSCLES, TENDONS ETC.

Compere, E. L.: *Streptococcus Viridans Osteomyelitis*. *J. Bone & Joint Surg.* 1932, 21: 244.

The author states that the streptococcus viridans may be the cause of certain conditions presenting the clinical and roentgen-ray characteristics of osteitis fibrosa and benign giant-cell tumor. He reports two cases of this type. Clinically both lesions were inflammatory. In the first case the microscopic picture confirmed the clinical diagnosis of osteitis fibrosa, but as cultures yielded a strain of green-producing streptococcus, the final diagnosis was osteomyelitis due to the streptococcus viridans. In the second case the cultures were negative, but the clinical and pathological findings were similar.

Compere urges more frequent bacteriological study of such lesions. He believes that the dearth of information regarding the incidence of streptococcus viridans infection of bone is due largely to the failure of physicians to apply the scientific investigation to bone infections that they apply to infections of the soft parts.

F. W. C. OSGOOD, M.D.

Berg, R. F.: Bone Sarcoma by Intramedullary Injections of the Filterable Fowl Endothelioma Tumor. *Am. J. Surg.* 1932, 47: 44.

In a foreword, Coley reviews briefly the work of Fujinami, Roux and Gye in demonstrating experimentally that a certain type of sarcoma in fowls can easily be transmitted from fowl to fowl indefinitely by means of a cell-free filtrate of the tumor. Coley holds that malignant tumors are due to an unknown extrinsic micro-organism, and that this theory and the local conditions explain why the number of cases of cancer varies in different geographic areas and in various races. The soil must be favorable. Coley considers cancer a systemic infection.

The experimental work of Berg was carried out on chickens with material obtained from Gye. Injections were made into the pectoral muscles. Tumors appeared in the breast in a large percentage of the chickens, but were especially common in the long bones. The growths were found from a few days to a few weeks after the injection. Berg emphasizes that several types of tumors arose from the same source and that the metastases were widely disseminated. Most of the chickens died in from fourteen to thirty-three days.

The results of the experiments are summarized as follows:

1. Malignant tumors were produced artificially with the use of filtrates of dried tumor tissue.

2. From the artificially produced tumor-tissue filtrates were produced other malignant tissues which were dissimilar in respect to morphology, histology and the dissemination of metastatic nodules.

3. On the usual media cultures of dried tissue and filtrate showed no growth, but when special media were used positive cultures were obtained in all tubes with the dried tissue and in one tube with the filtrate.

4. On the basis of the findings of roentgen-ray gross, histological, and clinical examinations the tumors were classified as (1) endotheliomas, (2) endothelial myxionomas, (3) osteogenic sarcomas, (4) giant-cell tumors, and (5) epithelial tumors.

H. EARLE COVEILL, M.D.

Des Barres, LeR., and Darrigamere, M.: Three Cases of Metastatic Osteoma of Articular Ligaments (Trois cas d'ostéomes métastatiques des ligaments articulaires). *Bull. et mém. Soc. méd. de Chir.* 1932, 1: 113, 23.

In the first case reported in this article the osteoma occurred in the ligaments of the knee and in the two others in the region of the shoulder. The authors believe that the condition should be called "metastatic juxta-articular ossification" as the name Pellegrini-Stieda disease applies only to the ligaments of the knee and the condition is a general reactional phenomenon of the connective tissue in the vicinity of bone which is associated with the transportation of calcium.

In the authors' first case the osteoma developed after a single slight injury. In the second, after several slight injuries and in the third, after a shell wound which was severe, but did not seriously involve the shoulder. In the last two cases several years elapsed between the time of the injury and the development of the symptoms. In the first case pain began after fifteen days, but the authors attributed it to hydrarthrosis caused by the synovial reaction as it ceased when the hydrarthrosis subsided.

In their reports of Pellegrini-Stieda disease, Leclerc and Policard called attention to the presence in the internal condyle of the femur opposite the shadows produced by the disease, of an area of decalcification indicating the transportation of calcium from the bone to the ligament to form the ankylosis of the osteoma. This area of decalcification is later repaired by calcium from other parts of the body.

The presence of a juxta-articular osteoma is of great medico-legal importance as it may entitle the subject to compensation.

As treatment, the authors recommend prolonged diathermy or deep irradiation. Surgery is indicated

only rarely    Massage and electrical treatment are  
contra-indicated                      EDITH S. MOORE

Moleen, G. A., Johnson, W. C., and Dixon, H. H.  
Familial Progressive Muscular Atrophy *Arch  
Neurol & Psychiat*, 1932, xxvii, 645

This is the report of a case of progressive muscular atrophy, that was followed for twenty-one years. The same condition was present in two of the patient's three brothers.

The patient showed a symmetrical muscular weakness and wasting which were noted first only in the hands and arms, but finally involved the entire body. The tendon reflexes were diminished, but always present. There was no pain or marked sensory disturbance and no ataxia. When the legs became involved a steppage gait developed. The condition progressed for twenty-one years and terminated in death from exhaustion.

The essential pathological changes were a non-inflammatory degeneration of the myelinated fibers of the peripheral nerves, which was most marked near the myoneural endings, and a 30 per cent decrease in the cells of the anterior gray horn. The cells of the anterior gray horn which remained were normal in appearance. The condition seemed to be primarily a non-inflammatory degeneration of the peripheral myelinated nerve fibers. Because of its familial character, the authors believe it may have been due to a congenital defect.

MAURICE L. DALE, M.D.

Nielsen, A. Osteochondritis Dissecans of the Head of the Radius (Osteochondritis dissecans capituli radii) *Acta chirurg Scand*, 1932, lxx, 305

The author reports three cases of typical osteochondritis dissecans occurring in the right elbow in young persons. The condition developed without noteworthy trauma and reduced the gross strength. It caused moderate pain on use of the arm, mild atrophy of the soft parts, and typical restriction of mobility. On roentgen examination and at operation it was found to have the same localization in all of the cases. In the supinated position of the forearm it was located on the part of the margin of the capitulum which faces the ulna. The detached piece of bone and cartilage and the surrounding tissues presented exactly the same appearance as recent osteochondritis of the head of the humerus and the femoral condyles.

Mouat, T. B., Wilkie, J., and Harding, H. E.  
Isolated Fracture of the Carpal Semilunar and Kienboeck's Disease *Brit J Surg*, 1932, vii, 577

The progressive degenerative changes in the carpal semilunar bone which were first described by Kienboeck are sometimes preceded by a fracture and sometimes occur without a definite injury. Kienboeck believed that they were similar to the changes occurring in Kummell's disease of the bodies of the vertebrae and attributed them to disturbances of the blood supply. The main blood



Bilateral Kienboeck's disease. Right wrist.

supply of the semilunar bone is derived from the dorsal ligaments and would be interfered with in temporary subluxations or other trauma to the wrist.

By some Kienboeck's disease is believed to be a posttraumatic osteoporosis, but examination of excised bone reveals a patchy necrosis with surrounding sclerosis, changes which are not those of osteoporosis. A similar patchy necrosis is seen in Legg-Perthes disease and in Freiberg's disease of the head of the second metatarsal. According to another theory, the changes in Kienboeck's disease may often be due to infarction caused by benign mycotic emboli in the absence of injury. It seems probable, however, that they are induced by injury—in some cases by repeated minimal traumata—and are



avored by the naturally poor blood supply of the semilunar bone, the liability of the bone to injury and subluxation in forceful dorsiflexion of the hand, and the fact that the bone is covered on two-thirds of its surface by cartilage which lacks the regenerative power of periosteum.

The clinical signs and symptoms of Klenboeck's disease are quite constant. In the majority of cases there is a history of definite injury usually a fall on the outstretched hand or a direct blow. Pain, swelling, and limitation of motion soon result and persist for a period ranging from a few days to several weeks. There is then a quiescent period ranging from months to years and at the end of that time a recurrence of the local symptoms. The recurrence may be gradual or may follow a slight injury or an occupational strain. In the absence of injury the onset is insidious. Tenderness is present over the bone, and an abnormal bony prominence may be palpated. Active and passive motion are limited and an intra-articular crepitus may be noted. The roentgen findings alone permit a correct diagnosis. The bone appears flattened and, in lateral views, is sausage-shaped. Its surface, which is wavy and irregular, is mottled by alternating areas of sclerosis and rarefaction. Fragmentation may be seen, and the bone may appear slightly rotated. It is probable that in many cases the changes follow slight fractures which are overlooked in the roentgenograms made immediately after an injury.

The histological findings in excised specimens vary with the extent and duration of the disease, but in general there is absorption of the bone lamellae with replacement by granulation tissue which goes on to form fibrous tissue instead of becoming calcified. This is a slow process, and the deformity may be aggravated by fresh injuries.

The prognosis depends upon the treatment. Poor results follow unrecognized fractures of the semilunar bone just as they follow unrecognized fractures of the carpal scaphoid. A fissured fracture should be treated by immobilization in dorsiflexion for six weeks before massage and active motion are begun. Compression fractures of the semilunar bone and well-developed cases of Klenboeck's disease should be treated by excision of the bone if this is justified by the patient's age and occupation. In questionable cases surgery is justified if rest and physiotherapy do not cause improvement.

The surgical excision should be done through a dorsal incision made over the bone and to the radial side of the extensor tendons to the index finger. The hand should be held in forcible adduction during the operation and all bone particles should be carefully removed.

Twelve cases are reported. Two of the roentgenograms in the article are included in this abstract. The authors' remarks and conclusions regarding compensation in cases of this kind are of value. The article is recommended particularly to those who are engaged in industrial work.

CHRISTIE C. GOTT, M.D.

## FRACTURES AND DISLOCATIONS

Christopher F.: Indications for Open Reduction of Fractures. *West. J. Surg. Obst. & Gynec.*, 1934, 21: 110.

The percentage of fractures operated upon ranges in different clinics from 4.6 to 45.5. After reviewing the literature and his own cases the author classifies fractures into three groups, those in which operation is indicated definitely, those in which it is contra-indicated definitely, and those in which the indication for operation is debatable.

He states that there is an undeniable indication for operation in skull fractures with depression and localizing symptoms or middle meningeal hemorrhage, vertebral fractures with spinal fluid leak, joint fractures with irreducible displacement, fractures of the patella and olecranon with wide separation, and certain fractures of the carpus and calcaneus.

Operation is contra-indicated in nearly all fractures of the clavicle, the distal end of the radius, the fibula, the long bones of children, and compression fractures of the vertebra without cord symptoms.

Fractures in which the indication for operation is debatable include transverse fractures of the femur, fractures of both bones of the forearm, and fractures of the neck of the femur. When in this last group attempts at non-operative reduction are unsuccessful after ten days it is much more conservative to operate than to continue the non-operative treatment.

The author discusses specific fractures and reports ten cases.

WALTER P. BLOUNT, M.D.

Hiltner, J. M.: Fractures at the Lower End of the Humerus in Adults. *Surg. Gyn. Obst. J.*, 1932, 22, 30.

Fractures at the lower end of the humerus are less common in adults than in children, but the methods of treating such fractures in adults are more varied than those for the treatment of fractures of the same type in children.

The author believes that in the attainment of a good functional end-result complete anatomical replacement of the fragments is of less importance than early active motion. Fractures of the lower end of the humerus are favored by anatomical weakness of this end of the bone and by the time of ossification of the lower epiphyseal line.

The exact nature of the fracture is determined by roentgen examination or if necessary by physical examination under anesthesia. In the author's treatment the patient is put to bed and the arm suspended with the elbow at right angles by means of adhesive applied to the forearm. Adhesive traction is then applied to the upper arm to relieve the muscle pull at the elbow. The adhesive straps are so placed on the medial and lateral aspects of the upper arm that, if necessary felt pads may be placed over the condyles to help crowd them together.

During the ensuing two weeks the elbow is subjected to manipulation, if this is indicated, and to active movement under the supervision of the surgeon. Passive motion is absolutely contra-indicated. Massage and the application of radiant heat are used to keep the soft parts pliable and are usually begun after from six to ten days. In cases in which the contour of the joint surface cannot be restored otherwise, in cases with a loose fragment in the joint, and in cases of diacondylar fracture separating the lower fragments, operation is done. In the last group arthroplasty is performed if the patient is seen early.

In the author's cases the average loss of extension has ranged from 20 to 25 degrees and the average loss of flexion from 25 to 30 degrees.

ARTHUR H. WEILAND, M D

Jones, Sir R. Injuries About the Elbow in Children. *Brit Med J*, 1932, 1, 39

The author states that although excellent results can be expected in the great majority of injuries of the elbow, it is wise to be conservative in the prognosis as occasionally failure occurs.

Roentgenograms taken in two positions are important in the diagnosis. In discussing the centers of ossification of the bones about the elbow joint, the author states that in the cases of children with undeveloped epiphyses the diagnosis must be based to a considerable extent on the findings of visual and manual examination. He emphasizes the importance of a thorough physical examination, describes the movements of the normal and injured elbow, and discusses dislocations and fractures about the elbow individually.

He states that there should be no delay in the reduction of a fracture or dislocation. When reduction is delayed until the swelling subsides there is danger of vascular obstruction. If the swelling is very great the degree of flexion should be modified temporarily. Under no circumstances should force be applied. When it is safe to flex the joint acutely no force is needed. Obstruction to flexion usually suggests that the fracture or dislocation is unreduced.

The normal flexion of the elbow varies from 14 to 40 degrees and averages 31 degrees. Because of the normal variation it is necessary to compare the flexion of the injured elbow with that of the normal elbow.

With regard to the danger of producing ischæmic palsy by acute flexion of the elbow the author says that by the term "acute flexion" he means, not fully forced flexion, but flexion to about 5 degrees short of full normal flexion. When the elbow is swollen and there is resistance to full flexion, the joint should not be subjected to force.

Ischæmic palsy may develop regardless of the position of the elbow. Therefore it is unjust to hold the practitioner liable for its occurrence. The author has used the flexed position for over forty years without causing ischæmia and has seen many old

cases of ischæmic paralysis in which the elbow was never acutely flexed or tightly bandaged.

In conclusion, the serious complications of injuries of the elbow—ischæmic contraction, nerve complications, and myositis ossificans—are discussed at length.

H. EARLE CONWELL, M D

Watson, W L. Fractures of the Lower Radial Epiphysis. *Arch Surg*, 1932, xxi, 492

Fracture of the lower radial epiphysis, the most common of all epiphyseal fractures, occurs most frequently in the second decade of life. It is usually caused in the same manner as the Colles type of fracture in adults, by indirect violence such as a back thrust from a fall on the outstretched hand or hyperextension.

The displacement of the epiphysis is usually upward and backward, although forward displacement is not uncommon. The diagnosis is usually based on the resulting dinner-fork deformity together with an increase in the anteroposterior diameter, limitation of flexion and extension, and radial deviation accompanied by pain and point tenderness on pressure over the epiphyseal line. When there is no displacement the diagnosis may be difficult as roentgenograms often do not reveal the fracture. Undiagnosed fractures are apt to arrest growth.

The most important complication is a disturbance of growth activity. The severity of the resulting deformity is dependent on the degree of injury to the epiphyseal cartilage and its blood supply. Minor injuries to these structures cause retardation of longitudinal growth, and more severe injuries produce premature ossification of the epiphysis to the diaphysis. The resulting degree of wrist deformity is greater the younger the patient at the time of the accident.

When there is no displacement or the displacement is easily reduced, the hand and forearm should be put up in a splint for from eighteen to twenty days. Complete displacement should be reduced under anaesthesia by hyperextension, traction, and flexion manipulation. In complicated cases open operation may be necessary. If complete reduction is obtained there is little tendency toward recurrence. In cases in which the epiphysis is severely comminuted or ankylosis appears certain, resection of all or a part of the injured radial epiphysis is necessary. Cessation of the growth of the radius after epiphyseal fracture may necessitate conjugal chondrectomy (excision of the conjugal cartilage of the ulna) or removal of a section of the shaft of the ulna.

In uncomplicated cases union takes place in the second or third week. Deformity is usually due to non-reduction, union in a faulty position, or arrest of growth of the radius. Watson advises a follow-up of the patient for at least two years. The prognosis should be guarded because it depends upon four factors: (1) the roentgen appearance, (2) the extent of the injury, (3) the reduction, and (4) the age of the patient.

Watson reports two cases of premature ossification of the lower radial epiphysis, in one of which conjugal chondrectomy was performed successfully  
 ROBERT S. KATZ, M. D.

Felsenreich, F.: End Results in Severe Wrist Injuries. Studies on the Causes of Disturbances of Function, Post-Traumatic Arthritis, and Nearthrosis in Traumatized and Postoperatively Crippled Wrist Joints (Spätergebnisse schwerer Handwurzelverletzungen. Studien über die Ursachen der Funktionsstörungen, der post-traumatischen Arthritis, sowie der Nearthrosenbildungen an traumatisch oder postoperativ defekten Handwurzelgelenken) *Arch. f. klin. Chir.* 1931, civl, 704.

The author compares the results of operative treatment with those of non-operative treatment of injuries of the wrist. He concludes that the results of operative methods have not come fully up to expectations. In no case has it been possible to re-establish normal conditions. While the function of the fingers and the gross muscular power of the hand have been restored as a rule, the extension of the wrist joint has always been limited to a certain degree after the operation. The cause of this faulty recovery of function is seen by the author in the interposition of bone fragments, usually from the semilunar bone, which were left behind at operation. The ulnar half of the scaphoid bone which is frequently dislocated toward the volar surface of the wrist may also cause functional disturbances. Before any attempt at reposition is made, roentgenograms should be taken in at least two directions. Only wide experience in the interpretation of roentgenograms will prevent the overlooking of dislocated fragments at operation. Incomplete removal of a fractured or dislocated carpal bone results in permanent and as a rule marked disturbances of function. The author therefore concludes that fractured or luxated bones of the wrist should always be removed completely not only to assure immediate restoration of function, but also to prevent the later development of arthritis. He believes that considerable improvement over the results formerly obtained by operation would be achieved if the Boehler extension apparatus were employed more extensively. This method offers the means of combating the greatest hindrance to proper reposition of the luxated fragments, viz., the impossibility by the use of conservative measures, of obtaining sufficient distraction of the other carpal bones.

Caution is necessary in determining the indications for even late operations as the results may be reduced by later abnormal regenerative processes. A possible tendency toward arthritis deformans must also be considered.  
 RAABENSTEIN (2)

Conwell, H. E.: Acute Fractures of the Spinal Vertebrae Without Cord Injury: With the Report of 100 Cases. *Wisc. Med. J.* 1931, xcvi, 490.

The author states that whereas formerly spinal fractures usually resulted in marked permanent

disability today permanent disability is often prevented by early diagnosis and proper treatment.

In 100 unselected cases of acute fracture of the vertebrae without cord injury which are reviewed by Conwell, the permanent disability averaged 215 per cent. The oldest patient was eighty-two and the youngest six years of age.

In the 64 cases of fracture due to industrial accidents the permanent disability averaged 347 per cent. Twenty-five patients with industrial injuries returned to full duty without any permanent disability. One died from edema of the lungs and 1 from septicemia following rupture of the bladder.

Of the patients whose fractures were caused by automobile and other non-industrial accidents, 1 died from shock and 1 from edema of the lungs, but the others returned to their original occupations or to productive work of the same character.

From prolonged observation of these cases the author draws the following conclusions.

First aid, consisting of proper splinting, careful handling, and treatment for shock, is important. When possible, the patient should be transported face downward.

An early and thorough physical examination is very important. Anteroposterior and lateral roentgenograms should be made even in the least suspicious back injuries.

The possibility of a vertebral fracture should be considered in the case of every patient complaining of pain in the back. Even when the first examinations are negative, opinion should be reserved until further observations are made. Especially in the aged, fractures of the vertebrae sometimes result from very slight trauma.

Occasionally collapse of a vertebra is found later when the roentgenograms made immediately after the injury were apparently negative. It is difficult and sometimes impossible to show the presence of a fracture in the posterior portion of the spine by roentgenograms.

In some cases collapse of a fractured vertebra occurs in spite of the best treatment.

In anterior compression fractures complete reduction is to be desired, but is not always possible. Collapse of a fractured vertebra sometimes occurs following perfect reduction.

At no time should reduction or other treatment of the spine be undertaken unless the general condition is sufficiently favorable. The patient, not the fracture, should receive the primary treatment.

In severe comminuted vertebral fractures which at first seem hopeless excellent functional results are frequently obtained because more bone area is present to form callus in the body of the vertebra or to produce physiological fusion at the vertebral articulations.

Physiological fusion at the articulations of the vertebrae is to be desired and occurred in a large number of the cases reviewed by the author.

In vertebral fractures of certain types, especially those in which roentgenograms show delay in the

development of bony union and those with persistent pain, operative fusion is indicated.

Operative fusion does not always relieve pain in the back, but usually prevents further collapse of the fractured vertebra. The author prefers the Hibbs' procedure.

In the author's cases of patients over forty years of age osteo-arthritis was a common complication.

The majority of back injuries are associated with fractures or injuries in other parts of the body.

In anterior compression fractures of vertebrae manipulative reduction under general anaesthesia is indicated only in certain cases and should be done only by experienced surgeons. The author brings about gradual hyperextension of the spine with the use of a convex Bradford (modified Herzmark) frame with or without traction to the head, pelvis, and legs. He recommends also the Rogers frame. When reduction is accomplished, he applies a plaster body cast which he molds to the normal curves of the spine and then treats the condition in the same way as other uncomplicated fractures of the spine. In some instances the entire bed treatment can be carried out on the frame and the plaster body cast used only in the ambulatory stage.

Too early weight-bearing, sitting, or walking should be avoided as it frequently causes collapse of the vertebra regardless of the efficiency of the ambulatory support.

There is no doubt that when collapse occurs in cases of spinal fracture with an originally good position and immediate proper treatment the cause is interference with the blood supply occurring at the time of the injury.

The supports should be left in place until physical examination and roentgenograms show sufficient callus formation, but should be removed as soon as possible in order to prevent muscular wasting and mental disability.

The psychological aspect of fractures of the spine is important. The patient should be informed regarding his condition, but assured that he will recover and has an excellent chance of resuming his occupation.

Jones, E. Trochanteric Transplantation in the Treatment of Fractures of the Neck of the Femur. *J Bone & Joint Surg*, 1932, *xv*, 259.

Jones reviews the principles and technique of the commonly recommended open operations for the treatment of recent fractures of the neck of the femur and presents the technique of an operation he has devised for fractures with delayed or faulty union as well as fresh fractures.

In the procedure described, a 6-in straight, external Langenbeck incision is made from the crest of the ilium downward over the trochanter and laterally along the shaft of the femur to a point 3 in below the greater trochanter, the vastus lateralis, gluteus medius, and joint capsule are incised longitudinally, and a bone graft about 3 in long,  $\frac{1}{2}$  in wide, and  $\frac{1}{4}$  in thick is removed from the

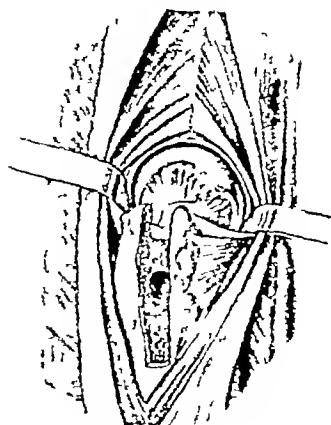


Fig 1 Showing the fracture reduced and the location and approximate size of the drill hole. The angle of the drill hole is easily determined through this exposure.

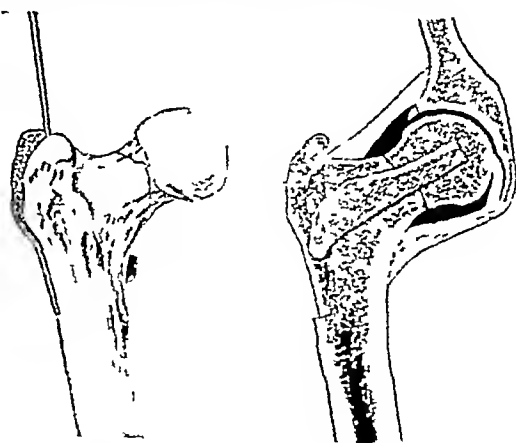


Fig 2

Fig 3

Fig 2 Showing the depth and extent of the bone graft. The graft is removed with a thin osteotome.

Fig 3 Diagrammatic section showing the structure of the bone graft. The bone graft is composed of a major amount of spongy bone to favor early vascularization and only a sufficient amount of cortical bone to maintain firm internal fixation.

external lateral surface of the femur and greater trochanter. A  $\frac{5}{8}$ -in drill hole is then made through the trochanter and neck into the head, its length being estimated from a roentgenogram of the normal hip, and the rectangular graft is driven into the drill hole with its trochanteric end outward. After closure of the wound in the usual manner a double plaster spica is applied with the limb in abduction and internal rotation.

The author emphasizes the conservatism of this procedure and the ease with which, through a single

incision, the site of the fracture can be carefully inspected and the direction and position of the transplant accurately determined.

PAUL C. COLOMBA, M.D.

BOPPE, M., BRAINE, J., ERLEBACH, P. J., GALEZZI, R., GALLIE, W. E., and Others: The Operative Treatment of the Fractured or Displaced Semilunar Cartilage. Opinions from Surgeons of Ten Countries. *J Bone & Joint Surg* 93 21 1951.

The opinions of surgeons of ten countries regarding the relation of the severity of an injury of a semilunar cartilage to the severity of the trauma causing the injury and their reports regarding the treatment employed in their cases of fractures and dislocations of the semilunar cartilages are summarized as follows:

BOPPE (France) There is no definite relation between the severity of the trauma and the severity of the injury to the cartilage but the pre-operative diagnosis is important in the choice of the incision. The lateral incision is used in most cases in which the diagnosis is clear and the meniscus is removed as completely as possible.

BRAINE (France) There is no relation between the severity of the trauma and the gravity of the lesion of the cartilage. The small incision is used, and the meniscus is removed as completely as possible. The lateral ligament is sutured carefully.

ERLEBACH (Austria) In some cases there is a distinct relation between the severity of the trauma and the injury to the cartilage. Surgery is indicated only in cases of secondary derangement. A small lateral incision is used. Complete or partial resection of the cartilage is done.

GALEZZI (Italy) The severity of the trauma has no special relation to the degree of injury to the meniscus. Of greater importance is the mechanism of the trauma. The lateral incision is used without severance of the lateral ligament. Occasionally a longitudinal popliteal incision is also employed. Complete or partial resection of the meniscus is done, depending upon the severity of the trauma, and full use of the knee is not allowed until after from thirty-five to forty days.

GALLIE (Canada) There is no relation between the severity of the trauma and the character and extent of the injury. A very small incision is made over the internal condyle of the femur. The treatment depends upon the conditions found when the joint is opened. The detached portion of the cartilage is removed. The patient is kept in bed for about two weeks. At the end of that time light weight bearing is permitted. Ordinary walking is allowed after five weeks.

HAAS (Austria) The severity of the trauma bears no relation to the character or severity of the injury. A parapatellar incision 8 cm. long is used and is sometimes extended to the S-shaped incision of PAYR. The lateral ligament is never incised. The injured meniscus is removed completely. The leg

is immobilized in plaster for eight days, the patient then being allowed to walk with the protection of an elastic bandage over the knee.

HENDERSON (United States) The severity of the trauma may not bear a direct relation to the extent of the injury to the meniscus, but because of possible additional injury to the ligaments stricken it may affect the future function of the joint. The short anterolateral incision is used with sometimes the addition of the posterolateral incision. In the majority of cases the entire cartilage is removed, but occasionally the posterior portion is left in situ. The patient is allowed to sit up on the second day wearing a splint. Weight-bearing is allowed after from five to seven days, depending upon the amount of effusion.

JARVIS (Holland) The severity of the trauma plays some part in the amount of injury to the tissues, particularly in the tearing or distention of the lateral ligaments. The small lateral incision is used. The lateral ligament is never severed. Only the detached portion of the cartilage is removed.

SIR ROBERT JONES (England) The severity of the trauma bears a relation to the extent of injury to the meniscus. The small lateral incision is used, with occasionally the addition of a perpendicular posterolateral incision. The median patellar or lateral patellar incisions are never necessary. Division of the lateral ligament to any extent is scrupulously avoided. As a rule the entire cartilage is removed. The patient is usually kept in bed for a week, and active movements are allowed after three weeks. Operation is avoided in the presence of effusion, and preliminary reduction is not attempted in cases of old displacement.

KOENIG (Czechoslovakia) The degree of the trauma bears no relation to the extent of the injury to the cartilage. The small curved lateral incision is used, and the injured meniscus is always removed completely. The patient is kept in bed for eight days and then allowed to walk with crutches.

MCMURRAY (England) There is no relation between the type of the trauma and the injury sustained by the meniscus. The type is more important than the severity of the trauma. The pre-operative diagnosis is of importance in the choice of the type of incision. The small anterolateral incision is used, and the entire meniscus is resected. The patient is kept recumbent for ten days. Free use of the knee is permitted after the twentieth day.

MOUCRET (France) The severity of the trauma bears no relation to the extent of the injury to the meniscus, but repeated injuries exert a definite influence. The internal transverse incision is used and the lateral ligament is sectioned if necessary. The meniscus is removed completely whether it is fractured or only displaced. The patient is kept in bed for twelve days.

PRIVILET (Czechoslovakia) External rotation and abduction of the tibia are of more importance than the severity of the trauma in injuries to the meniscus. The short transverse curved incision is

used, and the displaced portion of the cartilage is resected

PORTER (United States) A 3-in curved incision is used and the anterior three-fourths portion of the cartilage is resected. A posterior splint is applied for two days. On the third day the patient is allowed to get out of bed and start weight-bearing. After a week, partial use of the leg is allowed. Unrestricted use of the extremity is permitted after about four weeks.

POTTI (Italy) There is some relation between the severity of the trauma and the type of injury, but it is difficult to establish. The short inner incision is used, with section of the lateral ligament if necessary, and the entire cartilage is removed. Partial use of the extremity is allowed after fifteen days.

SHERMAN (United States) The severity of the trauma does not bear any relation to the extent of the injury to the meniscus, but may be responsible for injury to the associated structures of the knee joint. The detached portions of the cartilage are removed.

STEINMANN (Switzerland) The severity of the trauma bears no relation to the character or the amount of injury to the meniscus. The short lateral incision is used and sometimes extended forward according to the method of Pavr. A posterior in-

cision may be added. All movable portions of the cartilage are removed. The patient is kept in bed for approximately ten days. Unrestricted use of the extremity is permitted after about eight weeks.

TAVERNIER (France) The severity of the trauma and the severity of the lesion of the cartilage have no relation to each other. The meniscus is removed through a large transverse incision, with section of the lateral ligament. The entire cartilage is removed and a plaster cast applied for ten days. Weight-bearing is permitted after about eighteen days, and complete use of the extremity after three months.

TURNER (Russia) Only injured or protruding tabs of cartilage are removed unless deformity and cicatricial distortion indicates complete excision. The small curved lateral incision is used. Section of the ligament is never done, and the posterior incision is never employed. After two weeks in bed the patient is allowed to walk. Full use of the limb is permitted after five or six weeks.

WITTEL (Austria) The severity of the trauma and the character of the injury to the meniscus are not related. The entire cartilage is always removed through the median curved incision of Pavr. The knee is immobilized in a splint for eight days. Full weight-bearing is permitted after the ninth day.

ARTHUR H. WILLARD, M.D.

# SURGERY OF THE BLOOD AND LYMPH SYSTEMS

## BLOOD VESSELS

Reid, M. R.: The Effect of Arteriovenous Aneurisms upon the Heart. *Ann Surg* 93: 327-378.

In this article attention is again called to the fact that arteriovenous aneurisms involving large vessels usually affect the heart. The factor chiefly responsible for the cardiac damage is the increase in the amount of blood that the heart is obliged to care for. This is due to the quick shunting of a large amount of arterial blood back to the heart. Another factor of probable importance in the effect on the heart is the development of a condition resembling aortic insufficiency which occurs even when the lesion is far distant from the aortic valves.

The author reports a case of femoral arteriovenous aneurism of seventeen years duration which presented many of the effects of arteriovenous aneurisms of large vessels—cardiac hypertrophy and dilatation, Brachman's bradycardiac phenomenon, disturbances of blood pressure (Hill and Flack sign) changes in the electrocardiogram, pulsating varicose veins, dilatation and atrophy of the proximal artery capillary pulsation, and very adequate collateral circulation. Excision of the aneurism relieved all of the cardiac symptoms completely and caused the heart to return to its normal size.

This case supports Mace's teaching that the heart should be prepared for complete closure of the fistula by temporary occlusions of the fistula. Although the abundant collateral circulation reduces the danger of peripheral gangrene to the minimum, the heart must be partially adapted to the great and sudden change to be produced by the operation. An intelligent patient who has practiced temporary occlusion of his fistula is usually quite certain when the fistula can be permanently occluded without causing cardiac distress.

JACOB M. MOORE, M.D.

Technique: Experiences with Regard to Pain in the Sole of the Foot as an Early Symptom of Thrombosis (Erfahrungen ueber den Fusskies-druckschmerz als Fraehsymptom der Thrombose). *Arch f Klin Chir* 193: 241-245.

The author believes that the tenderness to pressure on the sole of the foot which Payr described as an early and warning sign of thrombosis of the lower extremity makes it possible to recognize thromboses which otherwise would probably remain latent. An important characteristic of this symptom is its early demonstrability. In all of the author's cases it was the first alarming indication which led to careful examination for evidences of thrombosis. Early recognition of the thrombosis permits early treatment. However the sign described occurs only in cases of thrombosis in the region of the foot and leg

and is absent in those of more centrally located thromboses—thromboses occurring in the pelvis and the region of the large venous trunks of the thigh.

H. STROOSCHOW (Z).

Henschen, F.: Proliferating Thrombopoietic Endothelioma in Local Vascular Lesions (Endothelioma proliferans thrombopoieticum des in Lokalen vaskularen lokalen). *Ann. Anat. path.* 1935, 15, 1-5.

In 1923 Masson described peculiar vascular lesions characterized by proliferation of the endothelium of the small vessels and thrombosis. The proliferation produced arborescent papilla which filled and dilated the vessels in much the same way as a papillary epithelioma of the breast dilates a lactiferous duct. Within the projections of endothelium there were deposits of a hyaline substance which Masson believed was fibrin.

Vascular lesions of this type are encountered most frequently in chronically inflamed structures such as haemorrhoids, urethral caruncles, cavernous haemangiomas, and polyps of the nose, digestive tract, and uterus.

Henschen discusses the nature of the lesions and the hyaline deposit in the endothelial vegetation.

Masson regarded the lesions as essentially neoplastic and called them "vegetating intravascular haemangioma-endotheliomas," but in Henschen's opinion they represent simply a form of endothelioma. Henschen found the hyaline material within the wall to be composed of erythrocytes. He states that although the endothelioma may be accompanied by thrombosis, the two conditions are distinct.

Attention is called to the similarity of the endothelial reaction to that observed in various general infections, hog cholera, and the colon bacillus septicaemia of rabbits.

ALBERT F. DE GROOT, M.D.

## BLOOD TRANSFUSION

Bordet, Sir T., Fildal, M. S., Finney A., and Webster J. H. D.: A Discussion on the Radiation Treatment of Leukemia. *Brit J Radiol* 934, 322.

Bordet stated that in leukemia the indirect effect of radiation treatment is of more importance than the direct effect. Webster agreed that some of the effect is indirect. Fildal reported that he had noted first a rapid decrease of the white cells, then a secondary increase, then another decrease, and finally another increase.

It was generally agreed that irradiation does not cure, but prolongs life. The chief benefit from its use is increased comfort. While the results of irradiation are more dramatic in the myelocytic type of leukemia, the end-results are better in the lymphatic type.

Holder stated that in his opinion the chief criteria for repetition of irradiation treatment are the general health, the weight, the temperature, and the general condition of the blood. According to Finzi, the red count and hæmoglobin are of most importance. Finzi believes that the majority of cases are undertreated. Therefore, even when the white count is normal, he continues the treatment until the red cells and hæmoglobin begin to increase. Piney believes that the more numerous the abnormal cells the more urgent the need of treatment.

Blood transfusions, arsenic, and liver as adjuncts to irradiation were discussed. It was agreed that they should not be given simultaneously with the irradiation treatment.

Holder stated that in his opinion irradiation has no place in the treatment of the acute forms or the acute phases of the chronic forms of leukaemia. Anæmia of the Addisonian type is a danger signal. Marked pyrexia, myocardial weakness, renal insufficiency, and hæmorrhages are contra-indications.

Finzi expressed doubt regarding the benefit to be derived from irradiation of parts of the body other than the spleen, even in cases of lymphatic leukaemia.

External applications of radium were characterized as helpful. No improvement had been observed following the use of radon solution.

CHARLES H. HEACOCK, M.D.

Piney, A. Conversion of Chronic into Acute Leukæmic Myelosis. A Contribution to the Study of the Myeloblast and of the Nature of the Leukæmic Process. *Brit J Radiol*, 1932, 1, 289.

In spite of many investigations regarding the primitive non-granular leucocyte there is no general agreement as to the nature of the cell. The author reports a study of this cell in a case of chronic leukæmic myelosis terminating acutely. On histological examination of the marrow of the humerus all of the cells were found to have the same characteristics. There was infiltration with almost complete disappearance of the cancellous bone. The marrow had the character of a true neoplasm.

The liver contained no leukæmic infiltration in spite of the fact that in the early chronic stage of the malady the blood picture was absolutely characteristic of chronic leukæmic myelosis. The findings suggested that a typical myeloid leukæmic infiltration had disappeared during the acute stage of the illness. If the infiltration forms and then disappears it would seem that the condition in such cases is a diffuse myelosarcomatosis. In the spleen in the case reported the evidence of infiltration in the sense of neoplasia was entirely microscopic as the capsule of the organ was intact, but practically all of the trabecular system of the spleen had disappeared and had been replaced by typical cells.

GEORGE A. COLLETT, M.D.



## SURGICAL TECHNIQUE

### OPERATIVE SURGERY AND TECHNIQUE; POSTOPERATIVE TREATMENT

Blair V. P., Brown, J. B., and Hamm, W. G.: *The Early Care of Burns and the Repair of Their Defects.* *J. Am. M. Ass.* 1935 XLVIII, 355.

Successful treatment of burns requires treatment of the patient himself, treatment of the injured tissues, the prevention of secondary damage, and early functional or cosmetic repair.

As an example, the authors cite a third-degree burn involving the skin of the dorsum of the hand without direct tendon involvement. They state that such a burn will eventually become covered with epithelium under almost any form of treatment, but unless proper treatment is given there will be marked impairment of function and deformity due to scar and secondary peri-arthritis. If the patient is seen early it is possible to obtain complete healing and good function within a few weeks by controlling the infection and transplanting skin.

At the time of the accident any treatment that lessens shock and controls pain is good treatment. Tanning is much better than the use of anesthetic. If the burn has destroyed the full thickness of the skin or more, the authors prefer to rely on the protective and reparative faculties of live tissues rather than on the chemical control of dead tissues, even though cure of such a wound without tanning requires painstaking extra work.

Applications of warm physiological sodium chloride solution or of a mild antiseptic facilitate drainage, allay pain, and stimulate the resistance of the surrounding tissues. By their use moist burns may be made sufficiently clean and the granulations sufficiently firm for grafting in from three to five weeks.

For patients who have long endured the discomfort of large infected raw surfaces and have become intolerant of dressing of the wounds, the use of salt baths alternating with periods of dry heat has been found the most comfortable treatment. As soon as a dressing can be borne, the patient should be encouraged to get out of bed. If only for a short period every day. Wet dressings are preferred, but it may be difficult to obtain a dressing comfortable enough to allow the patient to get out of bed. Since March, 1930, the authors have used as a dressing a water-soluble jelly to which from 2 to 5 per cent sodium chloride has been added. In many cases this has proved satisfactory.

Soon after the burn has occurred it may be impossible to differentiate between partial and full thickness destruction. This is one reason against immediate deep debridement and may account for the healing of many apparently deep burns with little scarring under almost any plan of treatment.

When spontaneous healing occurs the epithelium lies directly on a scar base made up of fibers arranged chiefly parallel with the surface and having a poor blood supply. Normal derma is not present, and hair follicles, sebaceous glands, and sudoriferous glands are regenerated. The ingrowing epithelium is usually only a few layers of cells in thickness and may show marked hyperkeratosis. Such surfaces may break down under irritation, and occasionally they undergo malignant change especially if the epithelium has been subjected to trauma. The scar contraction may cause serious fixation of joints or deformity of the involved part.

Early application of thick split skin grafts to granulating areas with loss of the full thickness of the skin will result in quick healing and usually a quite satisfactory appearance and surface protection.

When patients present themselves with healed deformities, it is necessary to determine the extent of the original loss and the tissues available for repair. Complete relaxation of the displaced tissues must be obtained by removing the binding scars and the resulting raw surfaces must be covered with tissue of a suitable thickness.

While split skin grafts are more likely to take, to shorten the operating and healing time and to be followed by less deformity to the donor area, full-thickness grafts are used when the best possible duty bearing surface and cosmetic result are desired.

Pacetto, G.: *Experimental Researches on Hemostasis by Biological Means, with Special Reference to Craniocerebral Surgery.* (*Ricerche sperimentali sull'ostasi con mezzi biologici, con particolare riguardo alla chirurgia craneo-cerebrale*) *Medicina, Roma*, 35, 1936, sec. 4, 1-2.

The author reviews the history of hemostasis and the more important researches. He considers biological methods after briefly discussing the mechanical, physical and chemical methods. Biological methods have included the use of subcutaneous fat, fascia, omentum, and muscle. Previous to 1930 only homologous tissue was employed, but in that year the use of heterologous muscle was introduced by De Martel. The latter is of course associated with some inconvenience and danger of infection.

In experimental studies of hemostasis in operations on the cranium, Pacetto found various heterologous muscle tissues of value. He studied also the hemostatic properties of tissue extracts. In wounds of the liver powdered extract prepared according to the method of Bordet and Delange was most satisfactory. Pacetto believes that the standardization and use of such extracts will prove of great aid in all types of surgery on the parenchymatous organs and the cranium.

A. LOUIS ROSE, M.D.

Sokolov, S. Postoperative Rupture of Abdominal Wounds with Protrusion or Prolapse of the Viscera (Die postoperative Ruptur der Bauchwunde mit Hervortreten oder Vorfalle der Eingeweide) *Vesnik Chir.*, 1931, LV/LXVI, 219

This comprehensive study is based upon an international questionnaire which was sent out to 1,140 surgeons. The reports of 187 surgeons on 725 cases are summarized in a table. About 50 German surgeons responded. In all, 233 answers were sent in, representing collectively the current century. Fourteen surgeons reported 10 or more cases. At the top of the list are Hesse and Sokolov with 36 cases and Radlinski and Traczuk with 31 cases.

According to the reports of 18 surgeons, the incidence of wound separation in all abdominal operations ranged from 0.03 to 3 per cent. The author believes that many cases are not reported and that the correct percentage is between 2 and 3. Wound separation occurs in males twice as often as in females. Of the 13 children with this complication, in the cases reported, only 3 were girls. In children the operation was usually performed for intussusception. In adults, the most frequent cause for operation was malignancy, the next, peptic ulcer, the third, gall stones, and the fourth, various forms of ileus. A seasonal influence was noted in that, especially among the northern people, wound separation occurred most frequently in the early part of the year. The author explains this fact on the basis of the general fatigue and a relative Vitamin C deficiency present during the winter months.

None of the various proposed abdominal incisions can be regarded as a certain preventive of wound separation, but the complication occurs most frequently following median incisions. Paramedian, transrectal, Pfannenstiel, and even muscle-splitting incisions for appendix operations are occasionally followed by wound separation.

With regard to the part played by the suture material it was found that most of the separations occurred in the cases in which silk was used. Nevertheless, the wounds separated in such a large number of cases in which catgut was used that, in view of the much less common use of catgut in the suturing of fascia, the greater unreliability of the latter material seems to be clearly demonstrated.

The danger of wound separation is greatest between the fifth and twelfth days after operation. Most separations occur on the eighth day. In the cases reviewed it occurred rather frequently also on the day on which the skin sutures were removed.

The most common cause was pulmonary disease, anemia and cachexia were second, and wound infection was third.

In 411 cases the wound was tightly closed again, with 132 deaths (a mortality of 32 per cent), while in 203 cases open treatment was used, with 72 deaths (a mortality of 35.4 per cent). Therefore, treatment with suture is apparently preferable. Of the causes of death, peritonitis was the most common, pneumonia next, shock third, and cachexia last.

As a prophylactic measure against wound separation, the author recommends a diet rich in Vitamin C, avoidance of the use of catgut for suture of the fascia, and, in the cases of patients who are coughing, the use of a large linen abdominal binder after the fifth day.

N. PETROV (Z)

Guthrie, D. The Treatment of Postoperative Obstruction. *Pennsylvania M. J.*, 1932, XXX, 376

Modern preparation for operation and modern operative technique have greatly reduced the mortality and morbidity of abdominal operations, but postoperative ileus is still a cause of postoperative death.

Both dynamic and adynamic ileus may be the result of prolonged operations, carelessly induced anesthesia, rough handling, loss of heat, time, and fluids, and the leaving of unperitonized surfaces in the abdomen. To reduce trauma, rough gauze dissection should be abandoned in favor of sharp dissection. In pelvic operations the induction of anesthesia should be begun with the patient in a high Trendelenburg position so that by the time the abdomen is opened the pelvis will be nearly freed of loose intestinal coils. The use of large quantities of gauze should be avoided. Frequently the end of a square of gauze in the upper angle of the wound is sufficient.

In cases in which spinal anesthesia can be induced the resulting relaxation of the abdominal wall and collapse of the small intestine are of great aid in procuring adequate exposure. Trauma to the small intestine, particularly the upper part, is one of the most common causes of postoperative ileus.

In postoperative adynamic ileus the symptoms are often indefinite and it is frequently difficult to distinguish the condition from mechanical ileus low in the intestine and beginning peritonitis. The patient is often of the neurotic type who does not withstand physical or psychological trauma well. There may have been some unusual degree of operative trauma and some postoperative shock. During the day following the operation the patient is restless and has an anxious expression. The pulse is rapid, the abdomen is distended and silent, and regurgitation of gastric and duodenal contents is noted. In some cases the ileus is self limited and subsides in from twenty-four to thirty-six hours.

The administration of fluids in large quantities is imperative. From 5 to 6 liters of water should be given every twenty-four hours. An inlying nasal catheter or frequent gastric lavage through a Levine tube will keep the stomach free from gas and secretions. The application of heat to the abdomen and strong psychological support are important. Frequent auscultation is necessary as a peristaltic sound may forecast improvement.

Bartlett's method of using spinal anesthesia postoperatively is advocated as the best means of distinguishing between dynamic and adynamic ileus. The spinal anesthesia is induced with the

patient in bed, but with the operating room ready. If a bowel movement is not obtained within fifteen minutes the patient is moved to the operating room and an enterostomy or a more radical procedure is carried out. The use of pituitrin is to be condemned. A greatly distended small intestine is unable to contract even after removal of the inhibitory control by the induction of spinal anesthesia and therefore requires enterostomy. Sometimes multiple enterostomies are necessary.

Dynamic ileus is easier to recognize than adynamic ileus as it is usually preceded by an inflammatory lesion or an operation in which an unperitonized surface is left. When the obstruction is in the upper half of the intestine there is little distention, but early vomiting and regularly recurring cramp-like pains are characteristic. Auscultation reveals exaggerated peristaltic sounds and the recoil of trapped gas and fluids during periods of pain. Careful inspection may disclose the presence of intestinal patterns, pathognomonic evidence of obstruction.

Barium given by mouth is dangerous and its administration by enema is of little value and causes dangerous delays. A roentgenogram of the abdomen without the use of an opaque substance may yield valuable information. In obstruction of the small intestine it shows a collapsed colon and parallel coils of distended small intestine in the herring-bone pattern or Kerkring's folds.

Morphine should be withheld until the diagnosis is established and arrangements have been made for operation.

The passage of gas with an enema is misleading as the gas comes from the part of the intestine below the obstruction. Purgatives only serve to increase the rapidity of reverse peristalsis. The results of delay in operation are increasing distention, a fast pulse, a leaky skin, a fatally silent abdomen, and fecal vomiting, all signs of impending death.

Operative treatment depends on the preoperative diagnosis and the general condition. If an obstruction of the upper or mid-portion of the intestine is diagnosed early when there is little distention and the patient is in good condition, the incision may be re-opened and the mechanical obstruction corrected. When there is more marked distention and the general condition is less favorable, enterostomy single or multiple, is necessary. When there is widespread early infection a complementary enterostomy is often indicated.

Holden's method of evacuation with direct emptying of the distended coils is held to be dangerous. In the presence of strangulation, enterostomy may save the life of a very ill patient and be followed by sufficient improvement to permit resection of the strangulation.

Salt solution should be given in large quantities. Hypertonic salt solution stimulates peristalsis and may aid in stimulating the distended bowel.

A left rectus incision from the costal arch downward for 6 cm. is usually sufficient except in the cases of patients with a large amount of sub-

cutaneous fat. The omentum, if it cannot be pulled upward, may be split in an avascular area. The rectal tube should be inserted with the tip downward in order to take advantage of the reverse waves. Side openings in the tube are of aid in procuring free drainage. The direction of the intestinal tube can be ascertained by following the root of the mesentery the hand inevitably being guided into the corresponding fossa of the same side. If drainage ceases, hourly irrigation of the enterostomy tube without pressure is advisable. Constant attention to the tube is necessary to determine whether drainage is sufficient.

E. E. Platt, M.D.

### ANTISEPTIC SURGERY; TREATMENT OF WOUNDS AND INFECTIONS

Iselin, M., and Ervand, H.: Anatomical Study of the Cellular Spaces of the Hand (*Étude anatomique des espaces cellulaires de la main*). *Ann. Chir. Path.*, 1931, 37.

The authors review the work of Karsner and Deuben on the cellular spaces of the hand and report in detail their own injection studies which are made on twenty-eight hands. Their findings are summarized as follows.

The hand has six cellular spaces each of which is a potential site for a special type of abscess.

1. The median superficial pretenodious palmar space. This is bounded superficially by the palmar aponeurosis, the thick layer of subcutaneous cellular tissue, and the skin, and dorsally by the volar surface of the tendons, the lumbrical tendons, the blood vessels of the superficial palmar arch, and the nerves. On the radial side it projects volar to the second metacarpal, sometimes even into the second intermetacarpal space, depending upon the site of fusion of the median palmar aponeurosis and the lateral intermuscular aponeurosis. On the ulnar side it projects into the fourth intermetacarpal space bounded by the union of the hypothenar aponeurosis with the median palmar aponeurosis. The proximal boundary is formed by the union of the superficial palmar aponeurosis to the volar carpal ligament, volar to which the superficial palmar space communicates with the forearm. The distal boundary is formed by the union of the aponeurosis with the superficial transverse ligament described by Pezder. In the distal portion of the palm there are strong, sagittally arranged fibrous partitions which enter the deep surface of the median palmar aponeurosis with the deep interosseous aponeurosis. In the proximal two-thirds of the palm these septa are absent.

The median superficial pretenodious palmar space communicates with (1) the forearm through the cellular tissue about the ulnar artery; (2) the first commissural space or lumbrical canal (but not with the thenar space) and (3) the retrocutaneous space (when the injection is made under marked pressure).

2. The deep middle palmar space. This is bounded superficially by the flexor tendons and their sheaths,

and dorsally by the deep palmar aponeurosis or interosseous aponeurosis medial to the anterior margin of the third metacarpal and by the horizontal inner portion of the external intermuscular aponeurosis lateral to the third metacarpal. On the radial side it is bounded by the vertical lateral part of the lateral intermuscular septum, and on the ulnar side by the medial intermuscular septum. Proximally, it is bounded by the cellular tissue at the level of the wrist joint, and distally, by the fibrous barriers stretched between the metacarpophalangeal articulations.

In its distal part this space is divided by the septa described by Legueu and Juvara into four small compartments, one for each finger. The compartment for the index finger is the most important because it is better individualized than the others, its radial part extending farther up into the hand.

When the injections were made under marked pressure the deep middle palmar space communicated with the fingers by way of the lumbrical canals and occasionally with the thenar space. It communicates with the forearm along the tendons under the transverse carpal ligament.

3 The commissural spaces. These are three in number and situated proximal to the interdigital commissures. They are bounded superficially by the skin and distally by the skin of the commissures and the interdigital palmar ligament described by Legueu and Juvara. Their deep boundary is the deep dorsal aponeurosis which is reinforced at this point by the superficial dorsal aponeurosis. Laterally they are bounded by the union of the skin with the pretendinous bands of the superficial median aponeurosis, and proximally, by the union of the skin with the transverse ligament. It was impossible to demonstrate any communication with neighboring commissural spaces or with the dorsal surface of the hand.

4 The thenar space. This is bounded superficially by the thenar aponeurosis or external intermuscular aponeurosis ending on the third metacarpal, deeply, by the deep bundles of the adductor pollicis brevis, and laterally, by the first metacarpal covered by the thenar muscle. It was impossible to demonstrate any communication with other spaces.

5 The hypothenar space. This is bounded on all sides by the hypothenar aponeurosis which begins on the lateral margin and ends on the ulnar margin of the fifth metacarpal.

6 The dorsal space. This space, which is elongated longitudinally, is bounded deeply by the extensor tendons joined together by the sheet of Morel and Duval, superficially, by the superficial dorsal aponeurosis and the skin, laterally, by the union of the superficial dorsal aponeurosis with the deep dorsal or interosseous aponeurosis, medially, by the insertion of the superficial dorsal aponeurosis on the fifth metacarpal, proximally, by the union of the dorsal aponeurosis with the dorsal carpal ligament, and distally, by the termination of the superficial aponeurosis on the fibrous sheaths of the fingers.

No communication could be demonstrated between the dorsal space and other spaces.

This anatomical study revealed the following problems which are yet to be solved:

1 The extension of infectious material from the pretendinous palmar space into the thenar space. While such extension is extremely frequent clinically, a communication between these spaces could not be demonstrated experimentally. The injected plaster displaced the external intermuscular aponeurosis outward in only one case and even in this instance did not invade the thenar space.

2 The extension of infectious material through the commissural spaces (a) toward the dorsal space, and (h) toward the neighboring commissural spaces. Extension toward the dorsal space probably occurs by way of the lymphatics. It is known that lymphatics from the palmar commissures empty into the dorsal collectors by a recurrent course. The route of the extension toward neighboring commissural spaces could not be definitely established although the occurrence of such extension is clinically indisputable.

3 The extension of infectious material along the lateral surface of the first phalanx. No communication by way of the cellular tissue could be established, but injection of the lymphatics in this region suggested that the extension of infectious material occurs by the lymph vessels.

4 The causation of suppurative arthritis of the wrist by a minimal lesion on the lateral surface of the first phalanges of the fingers. No direct connection was demonstrable. In an attempt to demonstrate a lymphatic connection by injections and dissections of the hands of fourteen fetuses at term, lymphatic trunks were found skirting the radio-carpal articulations, but no branches to the articulation were discovered.

EDITH S. MOORE.

## ANÆSTHESIA

Renton, D. G. Carbon Dioxide. Some Observations on Its Use and Abuse During Anæsthesia. *Med J. Australia*, 1932, 1, 121.

Carbon dioxide controls the mechanism of respiration by its action on the respiratory center. The carbon dioxide content of ordinary atmospheric air is 0.04 per cent, that of expired air, 4.10 per cent, and that of alveolar air, about 5 per cent.

Carbon dioxide is a valuable adjuvant in anæsthesia. It increases the depth of the respiratory movements, thereby increasing the ventilation of the lungs. Full oxygenation is necessary in anæsthesia, and no benefit will be obtained from the use of carbon dioxide in the presence of oxygen deficiency.

The induction of anæsthesia with ether or with the ethyl chloride-ether sequence or with nitrous oxide or ethylene and oxygen is materially shortened and rendered less distressing to the patient if a small amount of carbon dioxide is added to the anæsthetic agents. It is not advisable to hasten the induction of anæsthesia with chloroform.

During the maintenance of ether or chloroform anesthesia the addition of carbon dioxide is a remarkably rapid and efficient restorative measure if depression of the respiration or weakening of the pulse occurs. The anesthesia may be deepened by adding a little carbon dioxide and increasing the amount of ether or chloroform or lightened by adding a little carbon dioxide and decreasing the ether or chloroform.

It is in the use of the gaseous anesthetics that the carbon dioxide problem is ever present and difficulty is likely to occur when a closed system is employed. The waste of gases is excessive when no rebreathing apparatus is used. In the closed system the percentage of carbon dioxide increases rapidly so that unless there is a definite indication for stimulation, the presence of more than 5 per cent of carbon dioxide in the bag system overworks the respiratory center subjecting the patient to unnecessary fatigue.

To overcome the accumulation of carbon dioxide and to prevent waste of gases by repeated washing out of the system with fresh gases, a soda-lime carbon-dioxide absorption attachment should be used to keep the carbon-dioxide content of the system at a reasonable level. In this way with adequate additions of oxygen and nitrous oxide or ethylene, the amount of gases required to maintain a long anesthesia will be considerably reduced.

At the termination of ether anesthesia the addition of a 5 to 10 per cent mixture of carbon dioxide to air or oxygen aids the patient to excrete the ether more rapidly. However care is necessary for if the patient becomes unduly stimulated and the carbon dioxide is withdrawn, too much carbon dioxide will be washed out of the body and there will be a compensatory stage of respiratory depression. The

carbon dioxide should be withdrawn gradually so as to leave the patient in a respiratory state as nearly normal as possible. Carbon dioxide may be used with advantage also after chloroform or gas anesthesia. At the termination of endotracheal or pharyngeal anesthesia the addition of carbon dioxide is not only useful but necessary because of the continual washing out of carbon dioxide during anesthesia of these types. The administration of carbon dioxide helps by washing out the accumulated anesthetic and by restoring the carbon dioxide content of the blood to its normal level.

The use of carbon dioxide and oxygen is indicated during the postoperative period to prevent pulmonary atelectasis. Thorough lung ventilation at intervals prevents atelectasis and consequently decreases the danger of infection. The periods of treatment with carbon dioxide and oxygen should include an inhalation for from five to ten minutes at two-hour intervals in the first twenty-four hours.

A four-hour interval in the second twenty-four hours, at six-hour intervals in the third twenty-four hours, and so on, as long as deemed advisable.

The author reports two cases, both those of patients who were poor surgical risks. In the first case carbon dioxide stimulation of respiration made it possible to complete the operation. In the second, ethylene with a good deal of rebreathing was given for a short operation. Following the anesthesia, oxygen was used without rebreathing and without carbon dioxide. During its administration for fifteen minutes the respirations became more shallow and weak and the patient died. In the author's opinion the cause of death in this case was respiratory collapse due to sudden removal of the carbon dioxide stimulation.

J. EDWIN KIRKPATRICK, M.D.

# PHYSICO-CHEMICAL METHODS IN SURGERY

## ROENTGENOLOGY

Ravina, A., Sourice, A., and Benzaquen, L. Angiography and Angiopneumography (L'angiographie et l'angiopneumographie) *Presse méd.*, Par., 1932, 41, 287

In experiments on dogs the authors introduced a long sound through the external jugular vein into the heart and in some instances even into the pulmonary artery. They then injected an opaque substance through this sound and made roentgenographic studies of the pulmonary circulation. The most satisfactory opaque medium was sodium iodide in a 35 to 40 per cent solution. In the case of a dog weighing 15 kgm., from 10 to 20 ccm. of such a solution made good roentgenograms. Other iodine compounds such as mono-iodomethane sulphonate of sodium, and di-iodomethane sulphonate of sodium were also well tolerated.

C. D. HAAGENSEN, M.D.

Borak, J. The Coutard Method of Roentgen Therapy of Cancer (Ueber die Coutardsche Methode der Roentgenbehandlung des Krebses) *Wien med. Wchschr.*, 1931, 11, 1677, 1703

The author begins his article by citing two cases of sarcoma of the thigh in which roentgen irradiation caused complete disappearance of the tumor, but left a skin defect which had to be covered with a Thiersch flap. He then reminds us of the two basic principles of roentgen therapy:

1. The effect of roentgen (and radium) rays consists in a direct destruction of the cancer cells.

2. In the destruction of the cancer tissue the normal cells, connective tissue, and blood vessels must be protected.

He states that every cancerous tissue could be cured by the roentgen rays if the dosage was not definitely limited by injury to the normal tissue. Up to the present time, therefore, the cancer dose has been considered comparable to the skin erythema dose as a sign of beginning tissue injury. Hence it has been possible to cure only carcinomata having an irradiation sensitivity within this limitation.

The Coutard method attempts to increase the difference in the irradiation sensitivity of carcinoma and connective tissue. If the dosage causing inflammation of the skin is given, not at one sitting, but at several sittings on successive days, erythema will not develop. This fact constitutes the fundamental principle of the Coutard method, as the tolerance of the connective tissue and vascular apparatus is considerably increased by such division of the dosage. However, this fractioning in the Coutard method not only prevents the erythema of the skin when the skin-erythema dose is used, but

also makes it possible to give a total dosage which, if administered at a single sitting, would injure the tissues most severely. The total dosage recommended by Coutard for one field amounts to 3,500 r or even more. This dosage is tolerated by the skin only when the daily dose does not exceed from 10 to 200 r. If it is borne in mind that in a deep carcinoma several such fields may be treated, the total dosage in the depth may amount to approximately 10,000 r, which is about ten times the amount that it was possible to give formerly. The skin reacts to such a dosage by an epidermitis sicca in which the epidermis is completely exfoliated and the corium is exposed. That this dose is a good tolerance dose is evident from the fact that at the end of fourteen days the skin is completely re-formed, and by the fact that in his ten years' experience Coutard has never observed a late injury from its use. Therefore the epidermitis constitutes the upper limit of skin tolerance (the so-called skin-erythema dose of Coutard). Even injury of the subcutaneous blood vessels and the connective tissue is avoided, as was proved by histological studies of Miescher, Kahlsdorf, and Zuppinger which showed no inflammatory phenomena of any type.

Another factor in the Coutard method is the protraction of the single dose, the purpose of which is also to diminish the injury to the skin as much as possible. Coutard accomplishes this by increasing the filtration from 0.5 to 2.0 mm. of copper and increasing the distance from 40 to from 60 to 100 cm. He thereby increases the time in which the small dose is given from thirty minutes to from two to four hours. Therefore, according to the original method of Coutard, it is necessary to irradiate a patient with two fields of incidence at least daily for four hours and continue this treatment for from three to four weeks. Considered from the economic standpoint, this method can be carried out in the smallest roentgen institutes. Coutard recommends protraction of the single dose only for protection of the skin and not because of a possibly better effect on the carcinoma. The author, Miescher, and Chroul, irradiating with filtrations of 5 and 3 mm. of copper, were unable to determine any difference in the reactions of the skin and cancer tissue. The ratio of 1.4 in the irradiation period of the single dose therefore causes no differences in the biological effects. In Borak's cases a total dosage of 2,400 r was given, and in Chroul's cases, a total dosage of about 3,300 r or more. Pape's poor results were due to the fact that his single dose amounted to 700 r and was therefore much too large. It is thus apparent that with a daily application of from 150 to 220 r a total dosage of 3,600 r is tolerated by the skin just as well as with short periods of irradiation.

During the maintenance of ether or chloroform anesthesia the addition of carbon dioxide is a remarkably rapid and efficient restorative measure if depression of the respiration or weakening of the pulse occurs. The anesthesia may be deepened by adding a little carbon dioxide and increasing the amount of ether or chloroform or lightened by adding a little carbon dioxide and decreasing the ether or chloroform.

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J. EDWIN KIRKPATRICK, M.D.

## MISCELLANEOUS

### CLINICAL ENTITIES—GENERAL PHYSIOLOGICAL CONDITIONS

Archambault, LaS, and Fromm, N K Progressive Facial Hemi-Atrophy Report of Three Cases *Arch Neurol & Psychiat*, 1932, xxvii, 529

Progressive facial hemi-atrophy was first described by Romberg in 1846. Since then, about 400 cases have been reported. Among these, approximately 24 were cases of total facial hemi-atrophy and 27 were cases of double facial hemi-atrophy.

A number of theories advanced in earlier reports on facial hemi-atrophy have been either confirmed or revised. The supposed much greater incidence of the condition in females and on the left side of the face has not been substantiated. Facial hemi-atrophy may occur at any age, but is most frequent during the first two decades of life. As a rule the atrophic process involves all of the tissues of the face, but in some cases the skin, and in a few cases the bony structure, is not affected. Most severely involved are the subcutaneous fat and the connective tissue. The atrophy of the musculature is entirely bulk shrinkage. This is proved by the preservation of function and of normal electrical responses. In many cases the dystrophy extends to the neck or the upper part of the thorax and arm, and in some it involves the entire half of the body. Frequently it has developed first in the region of the second and third cervical roots, but it may begin at any point in the zone innervated by the trigeminal nerve. Alopecia of the face and occasionally of the scalp may antedate all other manifestations. The occurrence of pigmentary anomalies is not uncommon, but herpes, naevi, and telangiectases are rare. The vasomotor and secretory disturbances are not uniform, both deficient and exaggerated function having been observed in many instances. Horner's oculopupillary syndrome and trigeminal symptoms are discussed.

The authors report three cases in detail. In the first and third the process developed in the domain of the second and third cervical roots. Case 3 was characterized by alopecia of the scalp which antedated all other manifestations. In Case 1 the hemi atrophy began to appear within a few weeks after a traumatism of the cheek. In these cases all of the tissues of the face were involved.

Etiological factors are discussed. Inheritance of the condition and its occurrence in several members of a family are so rare as to be of little significance. In some cases its development follows a severe infectious disease. A circumscribed infectious focus (angina, peritonsillar abscess, periostitis) may represent a spontaneously occurring trauma exerting

much the same influence as external violence with the additional possibility of ascending perineural infection. A history of antecedent traumatism is given in from 25 to 35 per cent of cases.

In the evaluation of the various theories advanced to account for this peculiar dystrophy the cases and views of different investigators are analyzed in detail. The sclerodermal theory is not easily contradicted. It is admitted that in many cases a distinction between scleroderma and facial hemi-atrophy may be impossible, but the authors cannot agree with Cassirer that these conditions are identical. With regard to the trigeminal, the parasympathetic, and the endocrine theories the authors state that sufficient evidence has been furnished to prove conclusively that all three are totally untenable. Wartenberg's theory that the primary lesion is an encephalitis of the diencephalic floor, and the theory of Wolff and Ehrenclou that facial hemi-atrophy is merely one component of a general autonomic imbalance do not clarify the problem. Brissaud's theory of a cephalic trophoneurosis is acceptable insofar as it applies to total and crossed hemi-atrophies.

In the authors' opinion the sympathetic theory alone affords a satisfactory explanation of most, if not all, cases of facial hemi-atrophy thus far recorded. This theory is supported by the following facts:

- 1 Lesions compressing or otherwise injuring the so-called cervical sympathetic, which might well be designated the "craniofaciocervicothoracobrachial division of the sympathetic system," have determined progressive facial hemi atrophy on the corresponding side.

- 2 In the group of so-called symptomatic hemi-atrophies (syringomyelia, hæmatomyelia, brachial plexus injuries, bulbopontile foci of encephalitis) a concomitant Horner syndrome was present in the majority of the cases and not infrequently it was associated with vasomotor and secretory disturbances.

- 3 Pulmonary tuberculosis is mentioned in a large number of reports and was found in the 3 cases of so-called idiopathic facial hemi-atrophy that thus far have come to autopsy.

- 4 The distribution of the postganglionic fibers of the cervical sympathetic ganglia is so extensive that it embraces the region affected not only in cases of the usual type of facial hemi-atrophy, but also in cases in which the process extends to the base of the neck, the upper part of the thorax, and the upper extremity. This anatomical detail was confirmed by the investigations of earlier anatomophysiologists and by the recent researches of André-Thomas.



of the single dose. Because of this fact the Contard method of irradiation can be easily carried out by all roentgen institutes.

The chief question now is whether as a result of the huge increase in the dosage, a stronger effect is produced upon the carcinoma tissue. According to Wintz, carcinoma behaves in exactly the same way as the vascular layer of the skin. If the view of Wintz were correct, the method of Contard would be of no value as the carcinoma tissue would accommodate itself to the rays in exactly the same way as the skin. Regaud irradiated the testicles of rabbits in order to render them permanently azoospermatic. If this is to be accomplished at one sitting, it is necessary to give such a large dose that the scrotal skin would become severely necrotic. Temporary sterilization can be obtained also with small doses. Regaud divided the large total dose into daily small single doses and achieved complete azoospermia without injuring the skin. The time distribution therefore made possible an increased dosage which acted upon the testicular tissue but not upon the skin. Accordingly the view of Wintz can no longer be regarded as entirely valid. This is evident also from the results cited later in Borak's article. Regaud called attention to the fact that the skin and testicular tissue behave antagonistically. With the fractional irradiation the skin is desensitized and the testicles are sensitized. Moreover the biological similarity of testicular tissue and cancer tissue is greater than that of the blood vessels and cancer tissue. Contard has made a practical application of this theory.

In a period of four years 25 per cent of cases of carcinoma of the larynx of a type heretofore considered incurable have been cured by the Contard method. Of cases treated surgically a cure was obtained in only 6.6 per cent and these were operable cases in which complete extirpation of the larynx was done. Of cases of carcinoma of the tonsil of a type heretofore regarded as incurable, 26 per cent were cured by Contard irradiation. Similar results were obtained by Schlims in inoperable cases of carcinoma of the oral cavity pharynx, and larynx. The author reports successful results in cases of carcinoma of the uterine cervix in which post-operative recurrences disappeared quickly.

In the treatment of superficial canceroids of the skin the method has no special advantages over the irradiation used heretofore but in deep carcinoma terebraux, which is resistant to other methods of irradiation, it has a striking effect. It is of value also in inoperable carcinoma of the breast. It is applicable particularly to the glands in the axillary and supraclavicular fossae, in which a marked recession of the process should occur. In the treat-

ment of the primary tumor of the breast the irradiation must be given through two fields as the dose for the tumor itself must apparently be very large until the neoplasm recedes completely. This applies also to the ovaries, prostate, and thyroid gland, which, because of their glandular origin, are not so resistant to irradiation as tumors derived from superficial epithelium. The Contard method appears to be of value also in gastric and polynuclear carcinoma in which irradiation therapy has completely failed heretofore. Sielmann has obtained favorable results in several cases of inoperable gastric carcinoma. In cases of polynuclear carcinoma it has even been possible to make the stenosed bronchus patent again. Experience indicates that this type of irradiation is much more effective than that which was used heretofore.

Regaud's experiments have shown that the cumulative effects of the irradiation are greater in carcinoma than in the blood vessels. This seems to be in contradiction to the fact that markedly growing tissue shows less cumulative effects than resting tissue (Jungling). However carcinoma grows, not a uniform type of tissue, but those components (Regaud). In this connection attention is called to the so-called resting carcinoma cells which are described as mother cells of the carcinoma and are compared to the resting spermatogenic cells, namely those elements from which restitution of the tissue proceeds. Regaud emphasizes the importance of destroying these resting cells.

As the Contard method is still a very new method it presents several problems yet to be explained. For example the question arises as to whether the skin reaction can be considered a criterion of the dose required for the tumor. Some carcinoma recur after nine and others after thirty-nine irradiations. Other problems to be solved are the size of the single dose and of the total dosage indicated and the degree of the reaction of carcinoma of different origin. No definite rules can be formulated at the present time. With regard to the reaction upon the organism itself the author states that, besides the reaction in the mucous membrane of the oral cavity as epidermitis occurs, but this disappears completely after from two to three weeks. It has the appearance of diphtheria deposits with small erosions. Moreover after the administration of about 1,000 r a disturbance of the sense of taste is noted. With irradiation of the abdomen, diarrhea occurs, but ceases after fourteen days. According to Gloer and Zuppinger the blood reaction is very slight.

In conclusion the author says that the Contard method constitutes a considerable advance in the irradiation therapy of carcinoma, regardless of the site of the lesion.

RAAB (G).

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NOTE.—THE BOLD FACE FIGURES IN BRACKETS AT THE RIGHT OF A REFERENCE INDICATE THE PAGE OF THIS ISSUE ON WHICH AN ABSTRACT OF THE ARTICLE REFERRED TO MAY BE FOUND

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### Head

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5 The extensive investigations of Mueller and his pupils, Goering and Böwing, on the origin and distribution of the trophic fibers for the various peripheral tissues fully substantiates the claims of those who uphold the sympathetic theory.

6. In the 3 cases reported in this article the facial hemi-atrophy was accompanied by unequivocal indications of a disturbance of the corresponding side.

The simple and invaluable clinical methods of investigating sympathetic disturbances which have been devised by André-Thomas are more reliable than pharmacological tests. The authors main purpose has been to prove the unquestionably predominant rôle of the sympathetic system in the genesis of facial hemi-atrophy. They regard the dystrophy as a distinct syndrome comparable in large measure to other well recognized syndromes such as the parkinsonian syndrome and the syndrome of pseudobulbar paralysis.

As treatment of facial hemi-atrophy periauricular sympathectomy is suggested. This should be done in the earliest stage of the condition.

J. EDWIN KIRKPATRICK, M.D.

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In cancer during the earlier decades of life the index for plasma, whole blood and serum-whole blood is slightly higher than in cancer in the later decades of life. The indices are slightly lower in females than in males during the early decades of life and increase gradually in the fifth decade. In the averages for males and females there is some difference.

In epithelioma of the skin the averages are almost identical with those in cancer situated elsewhere.

The authors chose psoriasis as one of the diseases for control experiments because in certain instances an association has been suggested between this condition and abnormal fat metabolism. In a comparison of the results obtained in cancer with those obtained in psoriasis the index was found to be slightly higher in psoriasis.

The cholesterol indices for eczema, dermatitis, and a group of miscellaneous conditions exclusive of psoriasis were similar to those obtained in cancer.

It therefore appears that cholesterol indices are of no value for the detection of neoplastic conditions.

SAMUEL KAND, M.D.

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*Supplementary to*  
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# INTERNATIONAL ABSTRACT OF SURGERY

SEPTEMBER, 1932

## ABSTRACTS OF CURRENT LITERATURE SURGERY OF THE HEAD AND NECK

### HEAD

Orator, V The Surgery of Osteomata of the Vault of the Cranium (Beitrag zur Chirurgie der Schaedeldachosteome) *Deutsche Ztschr f Chir*, 1931, CCXXXIII, 459

The bony outgrowths of the cranial vault attain clinical importance when they grow toward the brain. They then decrease the space within the skull and must be removed. Therefore it is advisable to divide the larger osteomata into two types, those localized only on the outer surface of the cranial vault and those that penetrate. The cause of these bony tumors is unknown. Traumatic and inflammatory causes are not demonstrable. Syphilis may also be excluded. The growths occur remarkably often in young females.

Orator reports a penetrating osteoma of the right parietal bone in a woman twenty-two years of age. The tumor developed very gradually to the size of a fist within a period of twelve years and produced considerable disturbances in the general condition. After preliminary ligation of the external carotid artery, the tumor was removed in two sittings. Careful examination failed to reveal evidence of malignant degeneration.

A MEYER (Z)

### EYE

Lobeck, E Pneumococcic Infections of the Eye (Zur Frage der Pneumokokkeninfektionen am Auge) *Arch f Ophth*, 1931, CXXVII, 395

The author determined the type of pneumococcus found in a series of seven cases of pneumococcic conjunctivitis, twelve cases of lachrymal sac suppuration, and nine cases of ulcus serpens corneae. His findings were similar to those of Jahnke and Wamoscher.

He discovered that in simple pneumococcic conjunctivitis the prevailing type of pneumococcus was that which in animals, is avirulent. In dacryocystitis and ulcus serpens corneae the virulent pneumo-

cocci were more numerous. In addition, there was a difference in the number of virulent pneumococci in suppuration of the lachrymal sac and ulcus serpens on the one hand, and simple pneumococcic conjunctivitis on the other. In the healthy eye of the patient with suppuration of the lachrymal sac or ulcus serpens, virulent pneumococci were found much more rarely. In the majority of cases the clinically healthy eye was either entirely negative for pneumococci or the organisms present were of slighter virulence than in the diseased eye. There was therefore a difference between the healthy and the diseased eye in respect to both the occurrence and the virulence of the pneumococci. In the greater number of cases there was an agreement between the bacteriological findings in the sputum and in the eye, particularly when there was suppuration of the conjunctival sac. Pneumococci of Type 1 were demonstrable in the sputum in only one case of ulcus serpens in which virulent pneumococci of Type 4 were found in the lachrymal sac and on the conjunctiva of the diseased eye.

In the cases of ulcus serpens the organisms were found to be mostly pneumococci of Type 3 or 4. In only one case was the ulcer caused by pneumococci of Type 1 (virulent), which heretofore have never been reported as the cause of ulcus serpens. Pneumococci of Type 2 were never found, an experience contrary to that of Jahnke and Wamoscher. By means of the exact determination of virulence by Gundel's method, it was possible to divide the pneumococci of Type 4 into virulent and avirulent organisms and to distinguish those of virulent Types 1, 2, 3, and 4 from those of the avirulent Type 4. This distinction revealed the important fact that in ulcus serpens and suppuration of the lachrymal sac the virulent types of pneumococci predominate, while in simple pneumococcus conjunctivitis the avirulent type predominates. None of the patients had had previous treatment. With regard to the relation between the course of the corneal ulcer and the variety of pneumococcus found no conclusions could be drawn.

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# INTERNATIONAL ABSTRACT OF SURGERY

SEPTEMBER, 1932

## ABSTRACTS OF CURRENT LITERATURE SURGERY OF THE HEAD AND NECK

### HEAD

Orator, V The Surgery of Osteomata of the Vault of the Cranium (Beitrag zur Chirurgie der Schaedeldachosteome) *Deutsche Ztschr f Chir*, 1931, cccxxiii, 459

The bony outgrowths of the cranial vault attain clinical importance when they grow toward the brain. They then decrease the space within the skull and must be removed. Therefore it is advisable to divide the larger osteomata into two types, those localized only on the outer surface of the cranial vault and those that penetrate. The cause of these bony tumors is unknown. Traumatic and inflammatory causes are not demonstrable. Syphilis may also be excluded. The growths occur remarkably often in young females.

Orator reports a penetrating osteoma of the right parietal bone in a woman twenty-two years of age. The tumor developed very gradually to the size of a fist within a period of twelve years and produced considerable disturbances in the general condition. After preliminary ligation of the external carotid artery, the tumor was removed in two sittings. Careful examination failed to reveal evidence of malignant degeneration.

A MEYER (Z)

### EYE

Lobeck, E Pneumococcic Infections of the Eye (Zur Frage der Pneumokokkeninfektionen am Auge) *Arch f Ophth*, 1931, cxxvii, 395

The author determined the type of pneumococcus found in a series of seven cases of pneumococcic conjunctivitis, twelve cases of lachrymal sac suppuration and nine cases of ulcus serpens corneae. His findings were similar to those of Jahnke and Wamoscher.

He discovered that in simple pneumococcic conjunctivitis the prevailing type of pneumococcus was that which, in animals, is avirulent. In dacryocystitis and ulcus serpens corneae the virulent pneumo-

cocci were more numerous. In addition, there was a difference in the number of virulent pneumococci in suppuration of the lachrymal sac and ulcus serpens on the one hand, and simple pneumococcic conjunctivitis on the other. In the healthy eye of the patient with suppuration of the lachrymal sac or ulcus serpens, virulent pneumococci were found much more rarely. In the majority of cases the clinically healthy eye was either entirely negative for pneumococci or the organisms present were of slighter virulence than in the diseased eye. There was therefore a difference between the healthy and the diseased eye in respect to both the occurrence and the virulence of the pneumococci. In the greater number of cases there was an agreement between the bacteriological findings in the sputum and in the eye, particularly when there was suppuration of the conjunctival sac. Pneumococci of Type 1 were demonstrable in the sputum in only one case of ulcus serpens in which virulent pneumococci of Type 4 were found in the lachrymal sac and on the conjunctiva of the diseased eye.

In the cases of ulcus serpens the organisms were found to be mostly pneumococci of Type 3 or 4. In only one case was the ulcer caused by pneumococci of Type 1 (virulent), which heretofore have never been reported as the cause of ulcus serpens. Pneumococci of Type 2 were never found, an experience contrary to that of Jahnke and Wamoscher. By means of the exact determination of virulence by Gundel's method, it was possible to divide the pneumococci of Type 4 into virulent and avirulent organisms and to distinguish those of virulent Types 1, 2, 3 and 4 from those of the avirulent Type 4. This distinction revealed the important fact that in ulcus serpens and suppuration of the lachrymal sac the virulent types of pneumococci predominate, while in simple pneumococcus conjunctivitis the avirulent type predominates. None of the patients had had previous treatment. With regard to the relation between the course of the corneal ulcer and the variety of pneumococcus found no conclusions could be drawn.

By these researches the futility of specific serum therapy in pneumococcus diseases of the eye was proved anew as the only therapeutically active sera are of Types 1 and 3 and eye diseases due to these two types of pneumococci are rare.

VON HILDEBRANDT (O)

### EAR

Mygind, S. H.: The Indications for Radical Operation in Chronic Middle-Ear Suppuration. *J Laryngol & Otol.*, 93, xiv, 597

This article is based on 556 cases of chronic middle ear suppuration. The author states that the non-plastic total radical mastoid operation should be abandoned as it is mutilating and does not always prevent relapses and later complications. Barany's partial radical operation is indicated occasionally when hearing is still good in the affected ear or is especially defective in the other ear. Mygind prefers the old-fashioned plastic method with firm and protracted plugging.

He believes that chronic suppuration of the middle ear is the product of bacterial invasion, a predisposition, and a series of general pathological factors. Radical operation is first indicated when some complication such as sinus thrombosis, meningitis, or brain abscess develops. In the 333 cases with absolute indications for operation in the series reviewed the mortality was 14 per cent. A cholesteatoma was found in 216 of this group. In the presence of a cholesteatoma serious complications were twice as frequent. A cholesteatoma was found also in the majority of another operative group of 49 cases, this fact supporting the opinion that it is an imperative indication for operation. In the group of 74 cases with relative indications for operation depending upon the surgeon's judgment, there were 3 deaths. In the total number of cases in all groups the incidence of cholesteatomas was 56 per cent. In 50 of the cases operated upon for relative indications operation was unnecessary. The error was due to misleading vertigo nystagmus, headache, and mastoidal tenderness.

The author finds the treatment of chronic middle ear suppuration to be most difficult in the cases of children. He advises that children be subjected to a comprehensive medical examination. With regard to the treatment of adults he states that his position is distinctly conservative, but at the same time highly individualistic. GROSSER R. McAVILLY, M.D.

Tremble, G. E.: The Clinical Importance of the Mastoid Antrum. *Arch Otolaryngol* 93 xv 574.

The author states that in infants there are three anatomical features of the temporal bone which are of great surgical importance: (1) high position of the antrum, (2) absence of the mastoid process, and (3) an exposed position of the facial nerve.

The mastoid antrum is not the only pneumatic space present at birth. When the antrum is opened,

the surfaces are found to be dotted with immature cells. Although these cells are very small at first, they spread outward, backward, and downward with the developing mastoid until the entire process is invaded. In the pneumatic type of mastoid the cells usually have a very definite arrangement.

The cells spread out in a fan-shaped distribution from the antrum, becoming progressively larger as the outer borders of the mastoid are approached. Frequently the terminal cell at the tip of the mastoid is by far the largest. This description applies only to the cellular type, and not to the diploblastic or sclerotic mastoid processes.

The size of the antrum at birth varies. According to Gompers, the length is from 0 to 1 mm. and the breadth and height are from 6 to 7 mm.

These measurements are those of the average antrum not affected by disease. In a sclerotic mastoid the antrum is sometimes diminished in size or nearly obliterated, whereas in the mastoid with rarefying osteitis it is often greatly enlarged. In very rare instances the mastoid antrum is absent at birth.

The antrum of the infant is very superficial, being covered by only a thin lamella of bone extending downward from the squamous portion of the temporal surface. As the mastoid process develops, the antrum occupies a lower level and its depth increases. At birth, it is from 1 to 3 mm., and in the adult, it may be from 15 to 25 mm., from the surface.

JAMES C. BRADWELL, M.D.

### NOSE AND SINUSES

Flinder, G.: Cysts of the Nasopharyngeal Space, with a Report of Two Cases (Upper Cyst of the Nasopharynx). *Brit. Med. J.*, 1935, iv, 149.

The author has had the opportunity to observe two cases of nasopharyngeal cyst.

The first case was that of a forty-five-year-old man who complained of deafness with increasing deafness and nasal obstruction. Otological examination revealed bilateral tubal occlusion and a negative Rinne test. A whisper could be heard at 0.5 meter on the right side and at a meter on the left side, and the lower tone limit was raised. Anterior rhinoscopy was negative. Posterior rhinoscopy showed a smooth-walled, gray hemispherical tumor evidently arising from the roof of the pharynx and occupying almost the entire nasopharynx. The tumor was tender elastic. Puncture evacuated 6 c.cm. of a tenacious light brownish red fluid which on microscopic examination showed very numerous cholesterol crystals, a few erythrocytes, a few fat droplets, and isolated cuboidal cells. With a snare introduced through the nose, the greater part of the cyst was removed.

Histological examination of the cyst wall, proceeding from the external portion inward, showed externally several layers of cuboidal pavement epithelium; the uppermost layer of which was

cornified in places, and next to these a loose, very vascular connective tissue about 3 cm thick, which formed the chief constituent of the cyst wall. The latter was very rich in lymphocytes and contained a number of lymph follicles with distinct germinal centers. Internally, cylindrical epithelium was found with cilia in places.

On repeated re-examinations after removal of the cyst the pharyngeal roof was found to be completely smooth with no trace of a pharyngeal tonsil. At no time was it possible to find at the previous site of the cyst an opening which might have been interpreted as a communication with the pharyngeal bursa.

The second case was that of a thirty-five-year-old woman with no symptoms referred to the nasopharynx. Posterior rhinoscopy revealed a tumor in the center of the roof of the pharynx, just anterior to the posterior pharyngeal wall. The tumor was hemispherical, about the size of a small walnut, grayish red, and very soft on palpation. Light yellow fluid escaped on puncture. The tumor was removed in several pieces with the conchotome by way of the nasopharynx. The histological picture of the cyst wall was similar to that in the first case.

The pharyngeal bursa and pharyngeal tonsil are the most common sites of cyst formation. However, it is impossible to determine whether a nasopharyngeal cyst has its origin from the pharyngeal bursa or from a persistent recessus medius in a pharyngeal tonsil which has elsewhere undergone involution. Neither the histological structure of the cyst wall nor the contents of the cyst show its origin as in both cases the findings are the same. Clinically, only the size gives any indication, as large cysts which wholly or almost wholly fill the nasopharyngeal space probably originate in the pharyngeal bursa. Hernia of the brain through a persisting cranio-pharyngeal canal with protrusion of the meninges filled with fluid or of a portion of the brain which appears as a cyst in the nasopharyngeal space, is rare. Cysts of branchiogenic origin in the nasopharynx are even more unusual.

THEODOR ITENANN (H)

Mauerhofer, H. Primary Malignant Melanoma of the Nasopharynx, with the Report of a Case (Zur Kasuistik des primären malignen Melanoms im Nasen-Rachen) *Ztschr f Laryngol, Rhinol*, 1931, xxii, 16.

The author reports the second case of primary malignant melanoma of the nasopharynx to be recorded. The patient died of metastases in the brain. These tumors occur in the skin, mucous membrane, eye, and central nervous system. Fifteen primary malignant melanomata of the nose have been reported up to the present time, but only one of the nasopharynx.

The author's case of primary malignant melanoma of the nasopharynx was peculiar because of the metastasis. The clinical symptoms were characterized by difficulty in nasal breathing and in hearing, and especially by bloody expectoration, a phenom-

enon which occurs only in melanoma and not in the usual types of malignant tumor of the epipharynx. Whereas the usual tumors of the epipharynx cause death by destroying the neighboring organs (brain, spine), patients with melanoma almost always die of metastases before this stage of the disease is reached.

The route of metastasis is discussed in detail and three possibilities are considered: metastasis by the blood stream, by the lymph stream, and by retrograde embolism. The latter two routes both appear improbable. However, in the author's case, Most's lymph gland was involved, but the passage of tumor material from the nasopharynx into the frontal lobe of the brain refutes the general belief that the lymph stream is directed from the interior of the skull toward the pharynx. The author assumed that the tumor cells ruptured into the venous system with the formation of tumor thrombi and of metastases from emboli by way of the pulmonary circulation. A complete histological examination of serial sections of the left half of the base of the skull proved this theory to be correct. Tumor thrombi were found in the plexus pharyngeus and markedly pigmented round cells in the carotis interna. The lungs remained free because the patient died from the metastases in the brain before massive invasion of the vascular system took place.

The diagnosis of malignant melanoma of the nasopharynx can usually be made by inspection and biopsy, as in the case reported here. The prognosis is always unfavorable. The duration of the disease is usually from one to three years.

The author discusses also the therapy of these tumors. So far, surgery and irradiation with the roentgen rays and radium have been unsuccessful and in many cases have even hastened death.

L. KRAUS (H)

Amano, K. W. Paranasal Sinusitis. Opaque Displacement Diagnosis. *Arch Otolaryngol*, 1932, xi, 681.

The author states that roentgenographic examination of the nasal sinuses following the administration of iodized oil by the displacement method furnishes additional information as to whether drainage from the ostia is satisfactory or the sinuses or cells are filled with thickened membrane or pus. However, negative results following the administration of iodized oil do not always exclude the possibility of disease.

The practical value of the opaque displacement method in the diagnosis and treatment varies according to the nasal complications such as hypertrophy of the turbinates, especially the middle turbinates, and polyp. Removal of these obstructions should be advised before a roentgenographic examination by the displacement method is made.

The results of the administration of iodized oil by the Proetz method with the patient in the supine position are more accurate in the case of the ethmoid and sphenoid sinuses than in the case of the maxillary and frontal sinuses. For examination of the

maxillary sinuses the iodized oil should be injected by puncture through the inferior meatus or by cannula through the natural ostium.

For better results in the administration of iodized oil, especially into the frontal sinuses and the anterior ethmoid cells, the author recommends the use of an advanced prone or knee-chest position after the use of the Proetz method with the patient in the supine position. JAMES C. BRADWELL, M.D.

Peyton, W. T. Tumors of the Maxillary Sinus. *Am. J. Cancer* 93a, vii, 55

The treatment of cancer of the maxillary sinus has undergone a decided change in recent years. The results are now somewhat better although not entirely satisfactory. Formerly when the treatment consisted of resection of the superior maxilla alone, the mortality was high and the average duration of life after operation was eleven months. Survival for longer than three years after the operation was rare.

Recently there have been reports giving the results of radium therapy. In Schreiner's cases without regional metastases at the time of treatment the incidence of five-year cure was 50 per cent. In the cases with metastases there were no five-year cures. Of thirty-six patients whose cases were reported by New 52 per cent were living after more than three years and 1 per cent after more than five years. Of thirty-two patients treated by operation and radium irradiation whose cases were reported by Berwen, 19 per cent were living and free from recurrence for five or more years after the treatment.

Pertion reports eleven cases of squamous-cell carcinomas. Six of the patients were females. The average age was fifty-one years. The youngest patient was thirty-five, and the oldest sixty-two years. The average length of time elapsing between the appearance of the first symptom and treatment was eight months. The most common first symptoms were swelling and pain. Six of the patients had teeth extracted for the relief of pain. Regional glands were palpable in two cases.

The treatment consisted of irradiation or excision and irradiation. In most cases the external carotid artery was ligated as the first part of the operative procedure. The tumor mass was removed by surgical diathermy. Radium was then applied immediately and followed by high-voltage X-ray therapy. The average dose of radium was 1,700 mc-hr.

Of the two patients who are still living, one has survived more than five years without recurrence. Those who died lived approximately twenty-one months after the onset of the disease and ten months after treatment.

In conclusion the author states that surgery alone will not cure cancer of the antrum, but when a proper combination of surgery and radium irradiation is used a five-year cure may be obtained in 50 per cent of cases. JOHN F. DILLON, M.D.

## MOUTH

Dorrance, G. M.: The Repair of Cleft-Palate. Concerning the Palatine Insertion of the Superior Constrictor Muscle of the Pharynx and Its Significance in Cleft Palate; With Remarks on the "Push-Back Operation." *Ann. Surg.* 1931, xv, 541

It has been generally recognized that in most cases of cleft-palate the palate is shortened. A cleft of the velum alone and a cleft of the palate which extends as far forward as the anterior palatopharyngeal foramen are usually shorter than lip-vel-palate splits.

After successful operations for cleft-palate the variance in speech is dependent in part upon the variance in length of the palate, the length of the palate controlling to a great extent the efficiency of velopharyngeal closure. In some cases of cleft palate, Passavant's cushion, which is formed by the pterygopharyngeus portion of the superior constrictor muscle of the pharynx, bulges forward as a distinct ridge, whereas in others it is scarcely noticeable. Persons with cleft-velum frequently have poor speech results, whereas those with complete split palate not infrequently have excellent speech results.

In a study of the speech mechanism in two cases in which the nose and septum had been lost a sphincteric closure of the nasopharynx was observed. Further anatomical studies showed that the superior constrictor of the pharynx inserted into the velum and interlaced from side to side so that on contraction there was a definite sphincteric closure between the nasal and the oral pharynx.

Dorrance reports his findings with regard to the anatomy of the muscles of pharyngeal closure and reviews the literature.

He is convinced that the tensor palati muscle is shorter in persons with cleft-palate than in normal persons. He states that the independent pad carried on each side by the shortened muscle drags each half of the cleft velum forward and outward, causing the tips of the cleft avuls to point toward the median line. The cleft superior constrictor muscle of the pharynx in cleft-palate is unable to produce the desired sphincteric action between the oropharynx and nasopharynx, a function essential for normal speech.

Division of the hamular process will release the tension produced by the tensor palati muscle and thus permit medial displacement of the palatine insertion of the superior constrictor muscle of the pharynx. The function of the tensor palati muscle will also be altered from that of a tensor to that of an elevator, this muscle then assisting the levator palati muscle. In this way lateral tension is removed and the anterior ends of the cleft pharyngeal ring in split-palate can be approximated at the midline, the divided velopharyngeal sphincter being thereby reconstructed.

The object of the author's method of operating for cleft-palate is to restore the velum and pharynx

it in a normal or an approximately normal position so that the resultant velopharyngeal closure will adequately shut off the nasopharynx and permit distinct speech. For clefts of the velum Dorrance usually performs the two stage "push-back operation." In the first stage of this procedure the necessary relaxation incision is made to raise the palatine mucoperiosteum from before backward by dissecting it from the underlying bone with suitable elevators. The flap is then replaced in its original position and fixed with sutures.

In the second stage of the operation, which is performed from three to six weeks later, the mucoperiosteum is again elevated and the palatine aponeurosis and nasal mucous membrane are freed from their connection with the posterior border of the hard palate. By means of a chisel, the hamular process is divided on either side above its attachment to the mesial pterygoid plate. In all cases it is necessary to extend the relaxation incision backward around the tuberosity and over the pterygomandibular fold to obtain sufficient mesial displacement of the muscular tissue.

When the tension is freed, the two halves of the cleft meet easily in the midline and the velum is in contact with the pharyngeal wall. When the sutures are subsequently applied the pharyngeal sphincter is restored.

The next step consists in freshening the borders of the cleft and inserting interrupted sutures in the nasal mucous membrane. The ends of these sutures are left long and are not tied until the insertion of the intramuscular wire suture suggested by Veau.

After the insertion of the intramuscular wire suture the interrupted sutures in the nasal mucous membrane are tied and the two ends of the wire suture passed through the muscular tissue are twisted together to bring the flaps in apposition at the midline. The oral mucous membrane is united with coaptation sutures. The anterior extremity of the displaced palate is held against the denuded palatine vault with sutures passed through the bone.

In dealing with cases of lip-jaw-palate splits in which the soft tissue is of adequate length, a modified von Langenback procedure is used.

The "push-back operation" is employed in cases with congenital shortening of the palate, cleft-velum, and clefts of the palate extending as far forward as the anterior palatine foramen. The operation results in complete restoration of the palate. It is applicable also in cases of complete cleft-palate in which the velum is short and the von Langenback operation cannot insure success. In such cases there is a defect in the anterior portion of the hard palate. For this, the author recommends an obdurator-plate to which the teeth missing from the upper jaw may be attached.

Operation is best performed between the second and fifth years of age, preferably after the fourth year.

Speech training will do much toward improving speech habits, but the more satisfactorily the palate

is restored to establish a proper velopharyngeal sphincter the less will be the necessity for speech training.

JAMES B. BROWN, M.D.

## PHARYNX

Morris, C. W. *Anæsthesia for Major Throat Operations*. *Proc. Roy. Soc. Med.*, Lond., 1932, **xxv**, 945.

In an experience covering a period of twenty years the author has found that for operations on the hypopharynx for malignant growths the anæsthetic of choice is chloroform, and a tracheotomy opening is preferable to the use of an endotracheal tube passed down from above. He states that if a sufficient amount of oxygen is given with the chloroform and if the airway is kept perfectly free, as it is bound to be when a tracheotomy tube is inserted, there is no tendency toward congestion and hæmorrhage and at the end of an operation lasting up to two hours the patient usually leaves the table almost conscious, with the coughing reflex present, in excellent condition, and with very little, if any, acceleration of the pulse rate. Not infrequently, postoperative vomiting is absent or of the mildest character. In none of the author's cases has delayed chloroform poisoning developed.

JAMES C. BRASWELL, M.D.

## NECK

Travaglini, V. *Primary Neoplasms of the Vascular Sheath of the Jugulocarotid Fascia* (Sulle neoplasie primitive della guaina vascolare del fascio giugulo-carotideo). *Riforma med.*, 1932, **xlvi**, 431.

Tumors of the vascular sheaths may be derived from any of the various tissues making up the sheaths. They are more common in the veins than in the arteries.

The author reports the case of a man seventy years of age who sought treatment for a tumor in the carotid region which had been present for four months. During the first three months the growth of the neoplasm had been slow, but in the fourth month it was very rapid. At the time of examination the tumor was about the size of a small orange, hard, and movable. It was situated at about the level of the thyroid cartilage. The patient stated that occasionally pain radiated to the lobe of the ear and the temporal region. The carotid pulse was displaced laterally. A clinical diagnosis of probable branchiogenic carcinoma was made and resection advised.

At operation, the jugular vein was found so intimately attached to the tumor that resection of a portion of the vein was necessary. The resected tumor weighed 150 gm. and measured 7 by 4 by 3 cm. Its surface was irregular and penetrated by the jugular vein. The sheath of the jugular vein seemed to be everywhere intact. There were several lymph nodes on the surface.

Histological examination revealed different pictures in different portions of the tumor with gradual transformation from one region to the next. One



region showed the typical anaplastic picture of malignancy. The most probable origin of the tumor was the periaortic tissue.

The author says that the removal of such a tumor is difficult, but may be performed with relative safety if care is taken to retract the carotid artery and the vagus. It may be necessary to resect a portion of the jugular vein and the operation may be followed by slight aphasia. A. Louis Ross, M.D.

Glutz, J. M., and Lahey, F. H.: Thyroiditis. *Ann. Surg.* 1934, 100, 403.

Inflammations of the thyroid gland are relatively frequent. They may be divided into the simple, the suppurative, and the chronic. Each type may be primary in the thyroid or involve it secondarily.

Simple thyroiditis is not uncommon. It is usually secondary to a recurring infection of the tonsils, teeth or upper respiratory tract. It is characterized by pain and tenderness, a slight elevation of the temperature, and some increase in the basal metabolism. It usually runs its course within from twelve to eighteen days. Toxic symptoms, if present, disappear entirely and myxedema rarely ensues. The treatment consists of rest, cold applications, and the administration of sedatives for the relief of pain. Lugol's solution may be given to produce involution of the hyperplastic area and hasten the process of repair in the gland.

Suppurative thyroiditis is less common and much more severe than simple thyroiditis. It may follow a throat infection. The temperature reaches 103 degrees F. and repeated chills may occur. The thyroid gland is enlarged and extremely tender. Mild symptoms of hyperthyroidism may be present. If untreated, the abscess may rupture into the esophagus, trachea, or mediastinum, with perhaps fatal results. The treatment consists of drainage. When the inflammation is primary in the thyroid gland the prognosis is good, but when the thyroid is involved secondarily to a generalized infection the prognosis is unfavorable.

Chronic thyroiditis includes Riedel's struma, tuberculous and syphilitic thyroiditis, and thyroiditis with associated hyperplasia. Chronic thyroiditis may be a sequel to acute thyroiditis or may follow an infection of the teeth or throat. The inflammation may be accompanied by hyperplasia and hyperthyroidism. A pre-operative diagnosis is difficult. Operation is very frequently followed by myxedema. Therefore, if the nature of the condition is recognized, the operative procedure chosen should be one which while relieving the symptoms, will leave as much thyroid tissue as possible. Excision of the isthmus alone may be sufficient. Riedel's struma represents an extreme degree of chronic thyroiditis and is particularly prone to be followed by myxedema. Tuberculous thyroiditis is occasionally found on histological examination of operative specimens. It is of little clinical importance. Syphilitic thyroiditis usually responds well to specific treatment. Leo M. Zinnerman, M.D.

Jacobi, A.: The Biological Value, Iodine Content, Histological Structure, and Clinical Picture of Goiter. *Arch. Int. Med.* 1934, 124, 547.

Studies were made of the biological value, iodine content, and histological and clinical characteristics of a group of the principal types of goiters. The material consisted of operative specimens. The biological value of the thyroid tissue was determined by the Guderhach test and the Asker Stroff test for sensitivity to oxygen deprivation.

It was found that the correlation between the iodine and colloid content and between the iodine content and the biological activity of adenomata in California is not so close as that reported by Marine in Cleveland, but is greater than that found in Bern and Munich. In the adenomata, a high iodine content is usually associated with a high colloid content and a greater biological activity. The iodine content of adenomata seemed to parallel also the clinical activity. The relationship between the iodine content and the biological activity of hyperfunctioning adenomata differed from that of diffuse toxic goiter. It is inferred that all of the iodine is not present in an active form and that the quality rather than the quantity of the iodine compounds determines the biological and clinical activity of thyroid glands.

Hyperfunctioning adenomata differ biologically from the diffuse goiters of primary Basedow's disease. In the former there is a rather constant relationship between the iodine content and the clinical activity. In the latter iodine treatment results in an increased iodine content and greater biological activity but a reduction of clinical activity. These differences suggest a fundamental dissimilarity between the two forms of hyperthyroidism. The difference is probably due to a dysfunction in thyroid secretion in the various types of goiter the nature of which is as yet unknown.

Leo M. Zinnerman, M.D.

Pemberton, J. DeJ., and Williams, F. A.: Cardiac Features of Goiter. *Ann. Surg.* 1934, 100, 961.

The physiological changes which occur in exophthalmic goiter and hyperfunctioning adenomatous goiter are dependent mainly on the increased basal metabolic rate. The most prominent cardiac effect of hyperthyroidism is excessive rapidity of the heart beat.

Both exophthalmic goiter and hyperfunctioning adenomatous goiter are usually attended by alterations in the blood pressure. The most important change in the blood pressure is an increase in the pulse pressure.

In the hearts of patients dying in the active stage of hyperthyroidism no distinctive histopathological changes are to be found. Some clinicians maintain that cardiac hypertrophy occurs only when there is a primary and independent cardiac lesion which in itself is capable of increasing the mass of cardiac muscle. The authors do not accept this viewpoint because at the Mayo Clinic increases of from 100

to 200 gm beyond the accepted standard of Smith based on age, height, and weight have been found at autopsy in cases in which primary cardiac disease was absent

In the examination of patients with hyperthyroidism the most impressive cardiac finding is rapid and tumultuous cardiac action. In exophthalmic goiter this is usually more pronounced. The heart often appears to be definitely enlarged because of the rapid visible wave, and forcible apex beat. Systolic murmurs are commonly audible in the cardiac area. They occur chiefly at the apex and at the second left intercostal space. They vary in intensity and transmission. Unless caution is used the presence of murmurs may be interpreted erroneously as indicative of valvular disease.

Endocardial valvular disease is sometimes associated with hyperthyroidism, but not so frequently as current diagnoses suggest.

The most common disorder of rhythm is auricular fibrillation. This occurs in about a fourth of the cases of both thyroid diseases under discussion. Its persistence following thyroidectomy is suggestive of the presence of associated primary cardiac disease, residual cardiac injury from protracted hyperthyroidism, or the recurrent hyperthyroidism of exophthalmic goiter. When auricular fibrillation occurs in persons of middle or later life, attention should be at once directed to the possible presence of thyroidism, particularly a hyperfunctioning adenomatous goiter. Auricular fibrillation does not necessarily increase surgical risk, it is frequently present when cardiac injury is minimal.

The occurrence of congestive heart failure in the course of hyperthyroidism has been the subject of considerable controversy. There appears to be a rather widespread belief that congestive failure is evidence of associated and independent cardiac disease and that hyperthyroidism itself is not capable of producing heart failure. Nevertheless the occurrence of congestive failure solely as the result of hyperthyroidism has been proved many times by careful correlations of clinical data and autopsy findings. The occurrence of angina pectoris in patients with hyperthyroidism has received considerable attention. Recently Haines and Kepler reported distinct improvement in the anginal syndrome in most of their cases following partial thyroidectomy. They attributed the improvement to removal of the added work from the heart.

In the absence of congestive heart failure the heart usually does not require special treatment. The exception is the heart with auricular flutter. Auricular fibrillation rarely demands special treatment. Unless complications exist it is rarely necessary for the period of pre-operative rest to exceed two weeks. When congestive heart failure is present the treatment indicated is similar to that of primary heart disease without hyperthyroidism.

When cardiac function is restored the patient should be gradually returned to limited activity before being subjected to a surgical procedure.

Probably in no other cardiac disturbance has treatment been followed by more brilliant results than those obtained by partial thyroidectomy in cases of "goiter heart."

Pemberton and Willis believe that when the surgeon is faced with the serious problem of deciding for or against operation on a patient with marked decompensation of the heart and an apparently poor chance of recovery he should remember that his estimate of the hazard is subject to error and that the patient should be given whatever chance of recovery there may be.

As all patients with goiter are more or less debilitated and therefore particularly susceptible to pulmonary infection, the anæsthesia chosen should be the one least likely to favor this complication. Prolonged inhalation anæsthesia should be avoided. The anæsthesia should be such that the patient can be awakened, in a reasonable state of comfort, after resection of the first lobe in order that the functional integrity of the inferior laryngeal nerve can be determined. At the Mayo Clinic the anæsthesia of choice is combined anæsthesia, namely, infiltration with 0.5 per cent procain hydrochloride supplemented by nitrous oxide and oxygen by inhalation.

Friedgood, H. B. The Effect of Lugol's Solution on Chronic Lymphatic Leukæmia and Its Bearing upon the Pathogenesis of Exophthalmic Goiter. *Am J M Sc*, 1932, *CLXXIII*, 515.

Chronic lymphatic leukæmia is usually associated with an elevation of the basal metabolic rate. Because of the depressing effect of iodine on the basal metabolic rate in exophthalmic goiter and such conditions as pernicious anæmia, acromegaly, and polycythæmia, the author studied the effect of Lugol's solution on the basal metabolic rate, clinical picture, and laboratory findings in ten cases of chronic lymphatic leukæmia. In all of these cases there was a definite elevation of the basal metabolic rate, but the basal pulse rate was not materially increased. The physical signs and clinical symptoms of the disease were qualitatively similar to those of exophthalmic goiter although less marked. This fact suggested that the fundamental disturbance in both of these conditions is a hyperactivity of the sympathetic nervous system.

The administration of Lugol's solution produced a response similar to that seen in exophthalmic goiter, but the percentage frequency of the response was somewhat lower. The effects included a temporary decrease in the basal metabolic and pulse rates and a reduction of the nervous manifestations, the size of the lymph nodes and the total leucocyte count. In some cases the Lugol's solution seemed to increase the hæmorrhagic tendency and to lower the erythrocyte count and the hæmoglobin. Occasionally there was a paradoxical response with exaggeration of the sympathetocomimetic symptoms.

The author concludes that exophthalmic goiter is not a disease of the thyroid gland, but primarily

a disturbance of the sympathetic nervous system.

LEO M. ZIMMERMAN, M.D.

Wilson, J. G.: Laryngeal Vertigo: Its Relation to Cataplexy. *Arch. Otolaryngol.* 1931, XV, 334.

"Laryngeal vertigo" is the name applied to a sequence of abnormal motor responses produced reflexly from the larynx under conditions which are poorly understood. The essential phenomena are a fall with or without loss of consciousness and with speedy and complete recovery. Prolonged closure of the glottis with an increase in the intrapulmonary pressure may be associated with syncope.

It appears that in laryngeal vertigo and in some cases of cataplexy there are common factors, namely closure of the larynx and arrest of respiration followed by a fall to the ground. The fall can be explained by a diminution of tone in the postural muscles of the body. GEORGE A. COLLETT, M.D.

Hoover, W. B.: Bilateral Abductor Paralysis: Operative Treatment by Submucous Resection of the Vocal Cords. *Arch. Otolaryngol.* 1931, XV, 339.

In bilateral abductor paralysis there is a loss of function of the crico-arytenoidous posterior muscles which normally abduct the vocal cords, open the glottis, and permit the free passage of air from the upper to the lower respiratory passages.

Loss of this function must be the result of one or more lesions in the brain near the nuclei of the vagus or along the course of the vagus or recurrent laryngeal nerves. At the Lahey Clinic, bilateral abductor paralysis has been found due most frequently to direct trauma, injury due to surgical procedures in the regions through which these nerves pass, or direct pressure from involvement by a pathological condition in these regions. In seventeen of the author's eighteen cases the paralysis was related to a thyroid condition, and in fourteen it followed a thyroid operation. There is usually a history of hoarseness, loss of voice, "choking spells," and stridor following a thyroid operation. Examination shows the arytenoids and vocal cords in the median position with only a narrow opening between them and the cords drawn downward and closer together on inspiration.

The only method of treatment which the author has found of value is submucous resection of the cords and larynx. This consists in removal of the soft tissue between the mucous membrane and the cartilage of the lateral wall of the larynx to increase the lumen. Hoover describes the operation, reports cases in which it was used, and concludes that it is a relatively safe and certain method of overcoming the obstruction of bilateral abductor paralysis.

M. HERBERT BAKER, M.D.

# SURGERY OF THE NERVOUS SYSTEM

## BRAIN AND ITS COVERINGS, CRANIAL NERVES

Orlando, R. Ventriculoscopy (La ventriculosopia)  
*Sen ara med*, 1931, xxxvii, 1938

It has been very difficult to study the physiology of the gray nuclei at the base of the brain by electrical stimulation. The author proposes a new method in which electrodes are applied directly under the control of vision. He accomplishes this by means of ventriculoscopy. Encephalography or ventriculography is first done by Dandy's method. The roentgenograms thereby obtained give a good idea of the size, form, and position of the ventricles. Any of the prolongations of the ventricle can be studied with the patient in a sagittal position, but to study the gray nuclei a frontal approach is necessary.

Ventriculoscopy requires a certain amount of dilatation of the ventricles. For purposes of localization the patient's head is shaved and a point is marked 8 cm from the superciliary arch and  $1\frac{1}{2}$  cm from the frontal suture on the side to be examined. When a line is drawn from this point to the external orifice of the ear and a horizontal line is dropped to this point, the two lines form an acute angle of about 45 degrees which is open upward and forward. When this angle is compared with a similar angle on the lateral ventriculograms, measurements can be obtained which show the exact direction and inclination that must be given the needle and illuminating apparatus in order to strike the ventricle.

With the patient in ventral decubitus with his chin forward and firmly supported so as to immobilize his head, trephination is performed at the point mentioned and a fine needle is introduced into the ventricle. At a point about 3 mm from this needle a second needle is introduced to form a sort of track along which the ventriculoscope can be introduced.

The steps of the method are shown in illustrations.

This procedure was used in the case of a fourteen year-old boy, a congenital idiot with hydrocephalus. A good view of the walls of the lateral ventricle was obtained, but when the stimulating electrodes were introduced the light burned out and it was impossible to complete the examination.

AUDREY GOSS MORGAN M D

Adson, A. W. The Evaluation of Pneumoven-  
triculography and Encephalography. *Am J*  
*Roentgenol*, 1932, xxvii, 657

In a review of a series of 217 cases of suspected brain lesions Adson found that exploratory craniotomy was

performed in 187. The exploration was done for tumor or suspected tumor of the brain in 158 cases, for abscess of the brain in 11, and for miscellaneous cerebral lesions in 18.

The roentgenogram made positive localization of the lesion possible in 57 cases. In 85, it was negative, and in 74 it showed evidence of increased intracranial pressure.

Ventriculography is a valuable aid in the differential diagnosis and localization of brain tumors, but should not be used indiscriminately or substituted for thorough neurological examination. It is of particular value when the patient is comatose and when, therefore, it is difficult to elicit neurological signs. It is valuable also in distinguishing between tumors of the frontal lobe and the cerebellum. In some cases it may prevent an unnecessary craniotomy by revealing normal ventricles or a subcortical inaccessible tumor of the midbrain. Occasionally it may be employed as an aid in the localization and differential diagnosis of chronic brain abscess, but its routine use in this condition would be unwise as a sudden change in the intraventricular pressure may result in rupture of the abscess. It has proved of value also in the localization of baso-arachnoiditis obstructing the fourth ventricle. Occasionally it may be employed for that group of indeterminate cerebral lesions in which the symptoms suggest the presence of a degenerative process more than a tumor.

Encephalography is of greatest value in the differential diagnosis and localization of arachnoiditis, posttraumatic lesions, and atrophy of the brain. Occasionally it may be used as an aid to localization in cases in which tumor of the brain is suspected in the absence of increased intracranial pressure. According to Penfield and Frazier, it may be used occasionally as a therapeutic measure for posttraumatic cerebral lesions. The author has gained the impression that encephalography is being abused as it is sometimes employed in cases in which the clinical features are sufficient for diagnosis.

In comparing the studies of estimation of ventricular volume with those of ventriculography, it is apparent that the surgeon is able to determine whether one or both lateral ventricles are collapsed or dilated and whether they communicate with each other or with the postcisterna. This may be sufficient evidence to warrant immediate exploration without the use of ventriculography, especially if the tumor of the brain is situated in the posterior fossa.

In conclusion the author says that the best results in the localization of cerebral lesions are obtained by close cooperation between the neurologist, the radiologist, and the neurosurgeon.

Davidoff, L. M., and Dyke, C. G.: An Improved Method of Encephalography. *Bull. Neurol. Inst. New York* 1932 11, 75.

This article is a preliminary report limited to a description of certain improvements in the technique of encephalography. The authors wish to emphasize that it is possible to obtain good encephalograms with much less air than is usually introduced and thereby materially to decrease the discomfort to the patient both during and after the examination. The severity and duration of the symptoms occurring during and after the lumbar injection of air seem to depend upon the amount of air used in relation to the size of the ventricles. The authors have learned to determine the amount of air necessary in a given case by making a roentgenogram after the injection of 30 c.cm. of air. This roentgenogram shows whether the ventricular system is of normal size or dilated. If the size of the ventricles is within the normal limits, the injection of from 30 to 70 c.cm. of air is sufficient for excellent encephalograms.

The authors are convinced that for proper interpretation of the X-ray findings, stereoscopic roentgenograms should be made from four sides with the head both vertical and horizontal. They have followed this rule for two years in over 300 cases and have proved that the practice of taking roentgenograms in only the vertical or the horizontal position of the head may lead to error. They have been able to demonstrate also that the relatively large number of exposures is free from danger.

Eley, R. C., and Vogt, E. C.: Encephalography in Children: Further Observations in Children with Mixed Lesions of the Brain. *Am. J. Roentgenol.*, 1932 xviii, 680.

This article reports a continuation of the study reported by Crothers, Vogt and Eley in the *American Journal of Diseases of Children* in 1930. It is based on 350 cases of fixed lesions of the brain which were seen at the Children's and Infants' Hospital in Boston. There were no deaths directly attributable to the encephalography. The authors believe that encephalography is indicated when it is impossible fully to understand the conditions present or to offer definite information regarding the prognosis, educational problems, and disposition of the patient, and when it desired to present concrete and convincing evidence of the condition present to the patient's family. They consider it contra-indicated by evidence of increased intracranial pressure.

Following a description of their technique and a discussion of the common complications that may arise and their treatment, the authors report a number of cases to show the information that may be obtained by encephalography in fixed brain lesions caused by trauma, hemorrhage, developmental defects, and infection.

They conclude that the information obtained by encephalography warrants the risks involved, and

that judicious use of the procedure should eventually lead to a better understanding and classification of such conditions as epilepsy, febrile convulsions, and cerebral palsy in children. *Elec. Osborn, M.D.*

Bagley, C., Jr.: Spontaneous Cerebral Hemorrhage: Discussion of Four Types, with Surgical Considerations. *Arch. Neurol. & Psychiat.* 1932, xviii, 33.

Bagley discusses four types of spontaneous cerebral hemorrhage citing illustrative cases of each. The grouping depends first on whether the bleeding occurs into the meningeal spaces or into the brain. Cases of bleeding into the meningeal spaces are subdivided into those with a small and those with a large amount of blood in the cerebrospinal fluid, and cases of intracerebral bleeding are subdivided into those in which the clot is near the surface of the brain and those in which it is deep in the substance of the brain.

In cases of mild meningeal bleeding the patient suffers from headache, vomiting, confusion, and delirium of various degrees. Examination reveals a leucocytosis, moderate fever, an increased pulse rate, rigidity of the neck, and a positive Kernig sign. The spinal fluid is found mixed with blood which does not coagulate on standing, and the supernatant fluid is yellow. When the bleeding is moderately severe the disks may show edema. These are the most favorable cases, recovery usually resulting within a few weeks under treatment by judicious lumbar taps.

When the meningeal bleeding is severe the signs of meningeal irritation may be overshadowed by those of increased intracranial pressure. The immediate symptoms usually consist of convulsions and coma. If the blood accumulates at the base, there is high fever with a rapid pulse and respiratory rate. The blood may escape into the brain substance forming a clot and causing focal signs. The bleeding may be so excessive that the patient succumbs immediately or may become severe after a minor hemorrhage.

Intracerebral hemorrhage deep in the substance of the brain usually occurs in the region of the central ganglia although any part may be affected. In this condition paralysis usually occurs early and persists. The deep reflexes are abolished on the contralateral side, and the limbs are flaccid. When the hemorrhage is slight, partial or complete recovery may occur. When the extravasation is large the breathing becomes irregular and the pulse rapid, and death often results. Because of the serious damage to the brain and the inaccessibility of the lesion, neurosurgery is of little aid.

Superficial intracerebral hemorrhage is usually accompanied by signs of increased intracranial pressure and often by focal signs which occur suddenly and progress slowly. The condition is frequently amenable to surgical treatment by which the clot can be removed or if it has gone on to the stage of liquefaction, the blood can be aspirated.

With regard to the cause of spontaneous meningeal bleeding the author states that he has known

such hemorrhage to be due to the rupture of small aneurisms, congenitally weak arteries, and vessels damaged by sclerosis, syphilis, bacterial infection, or trauma

The cause of spontaneous intracerebral hemorrhage is still disputed. The author presents the views of various authorities who attribute such bleeding to the rupture of miliary aneurisms, arteriosclerosis, or preceding softening around the vessel, due perhaps to spasm, which permits leakage of the vessel wall

LEO M. DAVIDOFF, M D

Swift, G W Epilepsy *Surg, Gynec & Obst*, 1932, liv, 566

The author reviews the recent literature on idiopathic epilepsy especially as regards faulty water metabolism as the causative factor. He describes the anatomy and anomalies of the dural venous sinuses and discusses the effects of such anomalies upon the normal absorption of cerebrospinal fluid. He suggests that periodical convulsive seizures of idiopathic epilepsy may begin with a gradual accumulation of cerebrospinal fluid over the cortex and the cisterns of the brain which causes constant irritation of the cortex and particularly of the motor areas. He attributes this stasis of cerebrospinal fluid to blocking of cerebrospinal fluid absorption by an inflammatory condition of the arachnoid or of the pachimian bodies or by pressure upon or anomalies of the venous channels between the superior sinus and the heart. In 20 per cent of idiopathic epileptics he has been able to demonstrate anomalies of the dural venous sinuses which he believes may be corrected by what he calls "mobilization of the transverse sinus." He reasons that this mobilization produces sufficient improvement of the venous return to prevent, under normal conditions, an abnormal accumulation of cerebrospinal fluid in the subarachnoid spaces. The operation he advises consists of removal of the occipital bone overlying the transverse dural venous sinuses.

In reviewing the results of his operation over a period of approximately five years, Swift divides the 110 cases into 3 groups. The first group consisted of 33 cases which were operated upon in the period from 1925 to 1927. At that time the operation was merely a modified suboccipital decompression without opening of the dura and without an attempt to mobilize the transverse sinus. Three of the patients were reported as being cured and 15 as relieved of their grand mal seizures. In the second group, which consisted of 65 cases, the bone over the transverse sinus was removed and a modified suboccipital decompression was done. A cure resulted in 7 cases and relief of the grand mal seizures in 25. The 12 cases in the third group were operated upon most recently. In these, the sinuses were exposed more widely. Eleven patients have shown marked improvement in both the grand mal seizures and in mentality.

The author advises encephalographic studies before operation in all cases.

R. GLEN SPURLING, M D

Purves-Stewart, Sir J., and Hocking, F D M Disseminated Sclerosis *Lancet*, 1932, ccxxii, 605

The authors have confirmed the presence of spherules in cultures of cerebrospinal fluid from cases of disseminated sclerosis. They have found similar spheres in other organic nervous diseases—tabes, taboparalysis, amyotrophic lateral sclerosis, and tuberculous meningitis. They have found them also in pus-containing serous fluid from the pleura, peritoneum, and syphilitic chancre. They have never found them in normal fluids.

The 101 cases of multiple sclerosis reviewed were divided into 3 groups—early, moderately advanced and advanced. Of 22 early cases, all but 2 showed arrest of the condition or clinical improvement after treatment. Of 62 moderately advanced cases, the condition continued to advance in one-fifth and became arrested or improved in four-fifths. Of 17 advanced cases, the condition continued to progress in 5 and remained stationary in 12.

Of the 22 early cases, all of which yielded positive cultures, the cultures became negative after treatment in 3, became less strongly positive in 6, and remained unchanged in 15. Of the 62 moderately advanced cases, the cultures became negative in 4, became less strongly positive in 17, remained unchanged in 34, and became more strongly positive in 7. Of the 17 advanced cases, the cultures became negative in 3, became less strongly positive in 3, remained unchanged in 10, and became more positive in 1.

The characteristic colloidal gold curve was positive in 83 of the 101 cases. In 35 cases it showed definite improvement, in 11 it became more marked, and in 47 it remained unchanged.

The globulin reaction was positive in 72 cases, but in 24 of these it became negative or only faintly positive.

DAVID J. IMPASTATO, M D

Trías, A Intracranial Arteriography in the Diagnosis of Cerebral Tumors (*La arteriografía intracraneana en el diagnóstico de los tumores cerebrales*) *Rev de ciruj de Barcelona*, 1932, ii, 36

The author wonders why intracranial arteriography is ignored in the neurological clinics of Europe and America. He has used it himself in eight cases. The main carotid artery is exposed under local anesthesia. Moniz recommends preliminary elastic ligation of the artery and injection on one side at a time, but Trías since his first experience, has omitted compression, making the injection into the free artery. This permits him to do a bilateral injection at one sitting. The roentgenograms are taken immediately and very quickly—one tenth of a second. In the earlier cases in Trías' series from 6 to 8 c cm of a 25 per cent solution of sodium iodide were injected but in the later cases thorotrast was employed as it was found less distressing to the patients, especially those operated upon under local anesthesia. In several cases a second and even a third injection was necessary because the patient moved, but was without harmful effects.

Arteriography of the cerebral vessels is of diagnostic aid as arterial displacement indicates the presence of a tumor pushing the vessels out of their normal position and aneurysm indicates a pathological change in a cerebral area. Gliomata, meningioblastomata, angiomas, and cysts of a benign nature have been successfully diagnosed by this method. The author believes that cerebral arteriography should be used routinely in all neurological services as it is simple, harmless, and efficient.

JAMES T. CASE, M.D.

Cushing, H.: The Basophilic Adenomata of the Pituitary Body and Their Clinical Manifestations (Pituitary Basophilism). *Bull Johns Hopkins Hosp* Balt., 1932, 4, 37.

Attention is called to a polyglandular syndrome caused by basophilic adenomata of the pituitary body. This syndrome formerly supposed to be of adrenal cortex origin, is characterized chiefly by an acute plethoric adiposity, genital dystrophy, osteoporosis, vascular hypertension, and glycosuria. Cushing reviews twelve cases, two of which were his own. In six of the eight cases coming to autopsy a pituitary adenoma was found, and in the three most carefully studied cases the adenoma was shown definitely to be composed of basophilic elements.

In conclusion Cushing says that as a basophilic adenoma of the pituitary gland may cause this syndrome without producing apparent changes in the adrenal cortex other than a possible secondary hyperplasia, pathologists should make a careful study of the anterior lobe of the pituitary gland in cases which present the syndrome.

ROBERT ZOLLINGER, M.D.

Old, J. M., and Camas, O.: Two Cases of Ependymoma of the Third Ventricle (Dos casos de ependimoma del tercer ventrículo). *Rev. Méd. Lat. Am.*, 1932 xvii, 332.

Ependymomata of the brain are usually found in the fourth ventricle. Their occurrence in the third ventricle has been reported only a few times. In the authors two cases of ependymoma of the third ventricle the syndrome suggested a hypophyseal tumor. In the first case the neoplasm was manifested first by a psychosis. Later ocular and neurological symptoms developed. Autopsy disclosed a tumor extending from within the sella into the third ventricle. Microscopic study of tissue from different portions of the growth showed a uniform structure. In the second case there were ocular symptoms and X-ray examination suggested sellar changes. At operation performed under local anesthesia, a few small fragments of the tumor were removed with a curette. The patient was removed from the hospital by the family and died eight days after the operation. Autopsy was not performed but the diagnosis of ependymoma was based on examination of the fragments removed at operation.

Detailed histological descriptions of the theses from both cases are supplemented by photomicrographs.

A. E. TARR, M.D.

Davis, T. B.: Med. Uo-Epitheliomata of the Brain and Retina. *J. Path. & Bacteriol.*, 1932, xvi, 229.

Davis reports a pathological study of medullo-epitheliomata of the brain and retina and describes one such tumor of the cerebri and two of the retina. He agrees with Bailey and Cushing that the retinal and cerebral types should be classified separately. He believes that in describing these of retinal origin the suffix *retinae* should be used. His reasons for this are twofold. In the first place, the tumors arising in the cerebri spring only from the roof or floor plates of the brain, whereas any gliomata retinal growth which extends to the pars ciliaris retinae in this situation will show medullo-epitheliomata characteristics in this region. Secondly the two types differ histologically there being a difference in the stroma, and the retinal type shows no evidence of an external limiting membrane to the columnar cell layer.

The author concludes from his study of these tumors that the dictum "Malignancy of gliomata generally corresponds inversely to the differentiation of cellular type" must be accepted with caution. He states that medullo-epitheliomata must represent either the most de-differentiated state of a growth arising from matured forms of glial cells or purely undifferentiated tumors arising from such foci of primitive medullary epithelium as may remain in the developed brain and adnexa. He holds to the latter view because medullo-epitheliomata there is not found in mixed types of cerebral gliomata and all recorded examples of this tumor have arisen from sites in which primitive medullary epithelium is known to persist in the developed brain.

Davis urges that these tumors be reported more frequently as they constitute a distinct group and offer insights on the question of rapidity of growth of neoplasms.

ERIC OLSEN, M.D.

Crawford, A. S.: The Intracarotid Treatment of Meningitis. Experiences with Pregl's Solution of Iodine. A Further Report. *J. Am. M. Ass.*, 1932, xcvi, 53.

Crawford reviews thirty-one cases of meningitis reported from six clinics which were treated by intracarotid injections of Pregl's solution of iodine with or without the use of a specific serum or some other form of chemotherapy. Pregl's solution is a colloidal iodine solution made from a water-soluble compound with a 0.035 to 0.04 per cent content of free iodine and various iodine salts. In the twenty-five cases in which the condition was not due to the meningococcus there were six recoveries. In six of the meningococcal type which had shown an unfavorable response to special medical treatment there were four recoveries. Two recoveries resulted in five cases of brain abscess and also in three cases of septikemia. In a case of encephalitis death resulted, and in a case of Vincent's lung abscess the treatment was followed by improvement.

The author believes that in the treatment of certain cases of meningitis surgical assistance will

always be necessary. When a fibrinous exudate blocks communications early or prevents adequate distribution of injected remedies the intracarotid route of treatment is invaluable. By this method of administration a remedy may be made effective when otherwise it would fail. The intracarotid route seems to be the most direct and certain approach to the infected brain and membranes in meningitis.

Early diagnosis is of paramount importance. Adequate drainage should be established promptly. Continuous drainage is probably best. If this is established through needles, the punctures should be done regularly three or four times a day.

The treatment should be as specific as possible. When the condition is not likely to respond to medical treatment, surgery should be tried.

Pregl's solution of iodine may be administered safely in doses of from 20 to 30 c cm daily for three or four days. Its prolonged or excessive use, however, may damage the kidneys. There is practically no tendency toward thrombosis of vessels at the site of its injection. *ANTHONY F. SAVA, M.D.*

Sená, J. A. The Optic Canal. Roentgenological and Clinical Considerations (El conducto optico, consideraciones radiograficas y clinicas). *Semana med.*, 1932, xxxix, 702.

The most important contributions to the roentgenological study of the optic canal with regard particularly to tumors of the optic nerve, the retro-ocular extension of retinal gliomata, and the extension of orbital tumors to the cranial cavity have been made in North America and especially by Goalwin. The extension of orbital tumors is usually accompanied by enlargement of the optic nerve with a resulting dilatation of the canal which should be demonstrable in the roentgenogram. The roentgenogram will also show fractures in the vicinity of the optic canal consecutive to cranial traumatism. The author lists the indications for X-ray study of the optic canal as follows:

- 1 Optic neuritis, papillary stagnation, retrobulbar neuritis, and atrophy of the optic nerve
  - 2 Sphenoidal affections and other conditions related to the optic nerve
  - 3 Orbital, ocular, and optic nerve tumors
  - 4 Cranial fractures, certain or suspected, recent or old
  - 5 Foreign bodies in the orbit
  - 6 Deformities of the skull with vascular disturbances
  - 7 Tumors of the anterior and middle cranial fossæ
  - 8 Certain general conditions such as Paget's disease, acromegaly, and rickets
  - 9 Tuberculosis with symptoms related to the optic nerve
  - 10 Medicolegal cases in which indemnity is claimed for loss of vision caused by an accident
- The length of the optic canal varies from 2 to 10 mm and averages from 5 to 8 mm. Its diameter averages 4.5 mm.

The canal is subject to many anomalies, including total absence and duplication. Frequent variations occur also in the sphenoidal and ethmoidal sinuses. The canal is well developed in the early years of life. At the age of five years it is 4.5 mm long.

The first roentgenogram was obtained, in a fortuitous manner, by Rhese. In 1917, Stenvers studied the internal auditory canal to aid in the diagnosis of acoustic tumors and later he extended his method to include examination of the optic canal. Ball, Del Duca, and more recently, Goalwin have modified the position of Rhese. Arganarez has devised an instrument to place on the head for locating the central ray in the direction necessary to cast the shadow of the optic canal in the clear area of the orbit. The head piece is adaptable to any size and shape of cranium.

In the interpretation of the roentgen findings it is necessary to consider (1) the form of the optic canal in cross section, (2) the dimensions of this section, (3) changes in the lumen, (4) the structure of its walls and (5) changes in adjacent parts.

When a focus-film distance of 53 cm is used the dimensions of the optic canal are equivalent to the roentgenographic dimensions multiplied by 0.784.

The rest of the article is devoted to clinical considerations. *JAMES T. CASE, M.D.*

Harris, W., and Wright, A. D. The Treatment of Clonic Facial Spasm. (a) By Alcohol Injection. (b) By Nerve Anastomosis. *Lancet*, 1932, cccxii, 657.

Clonic facial spasm is an intermittent series of contractions of the facial muscles limited to one side of the face and not involving all of the facial musculature to an equal degree. The unilateral distribution of the spasms distinguishes the condition from spasmodic tic, psychomotor blepharospasm, habit spasms, chronic chorea, and other types of intermittent grimacing of psychical origin. Spontaneous cure of clonic facial spasm has never been reported.

The authors believe that the condition is due to some form of degenerative neuritis. The neuritis may be in the region of the geniculate ganglion since in a well-marked case of some years' duration it is always easy to demonstrate facial nerve weakness, contracture, and overaction on that side. Clonic facial spasm has followed Bell's palsy and has been seen in association with paroxysmal trigeminal neuralgia. It may develop also after local injuries to the parotid region or cheek, possibly as the result of scarring involving branches of the facial nerve. Hemispasm of the face may occur in cases of cerebral lesions such as those causing general paralysis and cases of encephalitis lethargica and basal tumor.

The results of the treatment of clonic facial spasm by the injection of alcohol are only temporary. The relief lasts only from three to six months. In the Schloesser method, the two main branches of the facial nerve are injected at the point where they cross the posterior border of the mandible.



in front of the ear. When both branches of the facial nerve are injected the resulting facial paralysis may be partial or total according to the amount of alcohol injected.

For permanent cure, the facial nerve must be divided and its peripheral portion permanently separated from the irritable center above. The treatment preferred by the authors is *faciohypoglossal* anastomosis. This has been used by them in five cases with favorable results. The operation and postoperative treatment are described in detail.

DAVID J. ISORANTO, M.D.

Seard, A.: The Arrangement of the Bundles in the Root of the Trigeminal (La disposition des racines dans la racine trijumeau). *J. n. d. act.* *Paris* 193 12, 581.

The author briefly reviews the literature on the anatomy of the posterior root of the trigeminal nerve and presents his findings in the dissection of forty two roots. The sensory and motor portions are considered separately.

Seard was struck by the extreme variation in the arrangement of the nerve fascicles in the sensory root. He states that he never found two alike, a fact which renders their description difficult. However he differentiated three general schematic types of arrangement.

In the first type which was found in twenty three roots, the fibers occupying the medial aspect of the root near the protuberance exposed themselves on the superior aspect of the root and ran toward the posterior border of the ganglion where they occupied about two-thirds of the superficial area and seemed to connect with the ophthalmic and maxillary portions of the ganglion and some of them also with the mandibular portion. The fibers from the external portion of the root near the pons underwent torsion in the inverse direction. Thus there was a double scroll-like formation, the internal fibers becoming superior and the external fibers becoming inferior the fibers from each of the ganglionic centers occupying at the same time the superior and the inferior part of the root.

In the second type of arrangement which was found in fifteen roots, the fibers ran almost parallel. The fibers from the internal border of the root were directed to the ophthalmic portion of the ganglion and those from the external border of the root to the mandibular portion. However in all cases some of the fibers crossed the superior or inferior aspect of the root from one border to the other.

The third type of arrangement was the reverse of the first type in that the fibers of the external aspect of the root at the pons became superior and were distributed to the external aspect of the ganglion while the internal fibers of the root became inferior and were distributed to the medial two-thirds of the ganglion. Very numerous anastomoses were noted at the posterior border of the ganglion frequently along the course of the root but rarely near the protuberance.

The author describes also fibers from the sensory portion entering the motor division close to the protuberance, fibers from the motor root entering the ganglion, and numerous anastomoses between the motor and sensory roots along their course. There were present in about 25 per cent of the roots examined. Seard believes they explain the persistence or the return of a degree of sensation which is sometimes noted in the area of mandibular supply after total neurotomy with conservation of the motor root. On the other hand he states that he has never been able to individualize the accessory sensory fibers which Dandy has described.

Seard concludes from these observations that it is never possible to affirm that partial section will interrupt or spare only the fibers going to one or the other of the peripheral branches but that when the medial one-fourth of the sensory root is conserved the fibers mediating corneal sensation are certain to be spared and postoperative eye complications may be avoided.

HALE HAYES, M.D.

Valentin, J. G.: Glosso-Palato-Pharyngo-Laryngeal Hemiplegia, Anterior Condylar-Posterior Lacrator Foramen Syndrome, or Paralysis of the Last Four Cranial Nerves (Hemiplegia glosso-palato-pharyngo-laryngea, ou syndrome condylar de la racine postérieure ou syndrome des quatre derniers nerfs crâniens). *Arch. de Soc. de med. de Porto Alegre*, 193 4, 13.

The point of exit of the glosso-pharyngeal, pneumogastric, and apical accessory nerves is the posterior lacrator foramen and that of the hypoglossal nerve the anterior condylar foramen. Paralysis of the pneumogastric nerve alone or with other nerves produces syndromes which have been given the names of the men who first described them.

Paralysis of all of the last four cranial nerves is unusual. It may be caused by infection, trauma, intoxication, or compression. The author reports the occurrence of such paralysis in a man twenty years of age who sustained a gunshot wound in which the bullet entered the cheek and came out through the nape of the neck. The anatomical relations of the involved region are shown by a diagram. For a month after the injury the patient was unable to speak. Thereafter he had difficulty in talking and his voice remained very hoarse. When he came for examination he complained of difficulty in deglutition and of excessive salivation. The tongue was deviated strongly to the right and the uvula to the left. During provoked nausea the pillars of the fauces and the soft palate on the left side were deviated toward the midline while those on the right side, with the exception of the posterior wall of the pharynx which was deviated to the left toward the midline, were immobile. The right lateral wall of the larynx was completely paralyzed and immovable whereas the left lateral wall was normal. The pharynx and larynx were hyperemic. On the back of the tongue a marked disturbance of taste for salt, sugar and quinine was found. The tongue and

pharynx were insensitive to touch, whereas both sides of the larynx were sensitive. Reflux of fluid sometimes occurred through the nose. The patient was unable to whistle. His voice was hoarse and nasal. No abnormalities of the eyes, ears, or face were found. The patient was able to work.

A number of similar cases from the literature are discussed briefly. They include a case reported by Cbaler and Gaumont, in which the condition was caused by malignant diptheria, a case reported by Bloch, in which the posterior lacerate foramen syndrome was associated with facial paralysis caused by trauma, and a case reported by Halplen, in which the condition was caused by adenopathy secondary to a malignant epithelioma of the sinus.

AUDREY GOSS MORGAN, M.D.

### SPINAL CORD AND ITS COVERINGS

Byers, R. K. *Transection of the Spinal Cord in the Newborn. A Case with Autopsy and Comparison with a Normal Cord at the Same Age*. *Arch. Neurol. & Psychiat.*, 1932, **xxvii**, 585.

Head and Riddoch found that a sufficiently large segment of human spinal cord isolated by a sharp transverse lesion developed extensive reflex activity following a period of spinal shock. Severe infection, especially in the bladder or in bedsores, seemed to prevent or diminish the reflex activity. The reflexes tended to include many segments of the cord and to involve the muscles, sweat glands, and hollow viscera. In the presence of a complete lesion the only movement obtained was flexion of the lower extremities and trunk. In cases of incomplete lesions extensor responses were often noted and the "mass reflex" was less widespread and never accompanied by the voiding of urine.

In the case reported by the author obstetrical trauma caused a transverse myelitis of the lower cervical cord. The infant lived four months. This length of time allowed the development of degeneration of the cord demonstrable by the Weigert staining method. The reflexes were found to be extensive and complex. The findings are reported in detail.

Examination of microscopic sections showed that above the transverse lesion there was practically complete degeneration of the myelin of the medial half of the posterior columns (tracts of Goll) and of the spinocerebellar tracts. The lateral and anterior columns were lightly stained, an unexplained finding. Below the lesion the corticospinal tracts were degenerated. There were also less well-defined areas of degeneration extending anteriorly from the corticospinal tracts and corresponding to groups of fibers of the other long efferent tracts.

In a comparison made with the normal cord of an infant who had died of bronchopneumonia at the age of four months it was found that the afferent fibers assembled into a compact group—the spinocerebellar tracts, posterior columns, and posterior nerve roots—were most intensely stained. The

efferent tracts—corticospinal, rubrospinal, and tectospinal—stained lightly, while the anterior nerve roots and ground bundles stained to an intermediate degree. The corticospinal tracts appeared to have the least well-developed myelin. The absence of a lightly stained area corresponding to the uncrossed corticospinal tracts was ascribed by the author to absence or small size of these tracts in the child examined.

E. S. PLATT, M.D.

Lorenzetti, C. *Early Laminectomy for Fracture of a Vertebra with Displacement and Paralysis from Compression of the Cord. Cure (Intervento precoce di laminectomia per fratture vertebrali con spostamento e paralisi da compressione midollare. Esito di guarigione)*. *Clin. chir.*, 1932, **viii**, 133.

There has been a great deal of discussion as to whether laminectomy is indicated for fractures of the vertebrae. The statistics are not very favorable. The Massachusetts General Hospital reported thirty-five operations with no cures, improvement in only three cases (9 per cent), no improvement in four cases (11 per cent), and death in twenty-eight cases (80 per cent). At the Surgical Clinic of Milan operation has been performed in three cases of total interruption of the cord and complete paralysis. One of the patients died four days after the operation and another died a little later from infection of the urinary tract. The third is living a year after the operation, but is bedridden.

The value of the operation depends upon whether the injury of the cord is total or partial, and this is often difficult to determine. If the injury of the cord is only functional and due to compression, operation will be successful, but if there is severe anatomical injury or complete interruption of the cord, operation will be useless and will expose the patient to the danger of infection.

The author reports the case of a woman twenty-four years old who sustained a fracture of the first lumbar vertebra in a fall from a balcony. The roentgenogram showed displacement of a fragment of the vertebra and there was flaccid paralysis of the lower limbs. The paralysis grew worse, but as sensation was preserved the interruption of the cord was evidently not complete. The injury affected chiefly the anterolateral motor tracts. A decompression operation was performed on the tenth day, and the patient recovered completely in two and a half months.

On the basis of this case the author concludes that operation is indicated if the roentgenogram shows displacement of a fragment with pressure on the cord, if there is preservation of motion or sensation below the injury, showing that the injury of the cord is only partial, and if initial improvement ceases or the signs of paralysis become worse. It should be performed within ten days after the accident, before the injury caused by the compression becomes irreparable. It should be performed slowly, with careful hæmostasis and without opening of the dura.

AUDREY GOSS MORGAN, M.D.

## PERIPHERAL NERVES

PoLock, L. J., and Davis, L.: Peripheral Nerve Injuries. Fifth Installment. *Am. J. Surg.* 1935, vol. 55.

The fifth installment of this monograph deals with the technique of operations on the peripheral nerves and the treatment to be given after such operations. The authors believe that the preparation of the operative field is best done by the surgeon himself as he has a better understanding than his assistants of the problems which may be encountered. An important factor is arrangement of the operative dressings so that the entire extremity will be freely exposed and so placed that it can be observed and manipulated without contamination of the surgical field.

The choice of anesthetic must be based on the requirements of the individual case. In the authors' cases local anesthesia is used as often as general anesthesia. The authors believe that the routine use of a tourniquet for hemostasis is contra-indicated, but emphasize that accurate hemostasis without undue trauma is essential for good results. Long incisions are advocated. The nerve trunks should be exposed above and below the lesion and then directed toward the site of the injury. Because of the danger of injuring the nerve trunk near the point of injury by mistaking it for scar tissue, the authors never attempt to find the divided nerve ends in the dense scar tissue which is usually present at the site of the lesion. When handling of the nerve is necessary during its exposure, this should be done as gently as possible. Methods of handling the nerve with minimal trauma are outlined. The nerve trunks should be kept moist with physiological salt solution while they are exposed.

The authors describe the technique of end-to-end suture and outline methods of grossly identifying the normal nerve end and of orienting the proximal end in relation to the distal segment so that the fascicular topography of the two will not be out of line any more than necessary. The finest of silk suture material is used by the authors in preference to catgut because of its greater tensile strength and because the reaction of the tissues to it is less than the reaction to catgut.

Methods of overcoming large defects and still getting end-to-end apposition of the severed nerve, such as mobilization of the nerve trunks, changing the joint position, transposition of the nerves, and two or more stage stretching operations, are described in detail. The techniques of nerve crossing, nerve grafting, and neurolysis are also discussed. The electrical examination of the nerves at operation by the application of a faradic current through sterile electrodes is considered by the authors to be invaluable in the determination of the functional integrity of a nerve trunk or its component branches and bundles. The practice of testing the function of a nerve trunk by pinching with forceps or a hemostat is condemned.

The authors consider the after-treatment of patients who have had a peripheral nerve injury to be as important as the operative procedure. They state that it is of little value to suture a severed nerve and gain regeneration of its fibers if the effector mechanisms are shortened, contracted, fibrotic, and ankylosed. A result which is the normal physiological function of the part involved can be obtained in the majority of cases by the help of passive and active exercises, massage, electrotherapy and the use of splints if these adjuncts are employed correctly and at the proper time. Details of the indications for and the application of these adjuncts are given. Methods of massage and electrostimulation of the parietic muscles are outlined, and the splints indicated for each of the more common types of nerve lesion are described.

HALE ELVER M.D.

## SYMPATHETIC NERVES

Pieri, G.: The Treatment of Hyperhidrosis (Excessive Perspiration). *Arch. Ital. di chir.* 1935, vol. 117.

Hyperhidrosis is of three main types—symptomatic, idiopathic, and functional. Symptomatic hyperhidrosis is usually secondary to disturbances in organs other than the sweat glands, especially in the nervous system. Idiopathic hyperhidrosis is not easily explained. Functional hyperhidrosis is simply an exaggeration of the normal sweating function. Although it is impossible to classify all cases of hyperhidrosis as belonging to one of these types, this is a good working classification.

Pieri reports five cases of hyperhidrosis which were cured by surgery. One was a case of symptomatic hyperhidrosis of the lower extremities based on a sympatheticonic state; another was a case of idiopathic hyperhidrosis of one side of the face; and three were cases of functional hyperhidrosis localized principally in the feet.

While hyperhidrosis is not a condition which makes surgical treatment imperative, many persons with the condition are disturbed by it sufficiently both physically and psychologically to desire relief. It may cause psychic disturbances due to odor, incapacity for certain types of work, or severe irritation and laceration of the skin. Therefore we may speak of a relative indication for surgery in profuse hyperhidrosis.

The surgeon attempts to interrupt the sympathetic fibers at the most suitable sites. In early work, Brauer divided the rami communicantes corresponding to the dermatomes affected, but in cases in which the origin of the ailment is probably in the sympathetic chain this procedure is useless. In cases of the latter type it is better to resect the involved ganglia or simply to interrupt the nerve pathways.

The author suggests that section of the rami communicantes is advisable when the hyperhidrosis is well circumscribed or the region is so large that resection of the chain or ganglia will be too consid-

able When the hyperhidrosis is associated with other trophic disturbances, resection of the ganglia alone may be advisable As in this procedure many other fibers are removed, some unnecessary functional mutilation may result The optimum place for intervention is at the internodal rami, where the fibers to the sweating areas converge At this site a maximal effect is obtained with minimal trauma

Hyperhidrosis of the face is best treated by section of the carotid nerve, a prolongation upward of the superior cervical ganglion Section of this nerve results in anhidrosis of the corresponding half of the face down to the level of the hyoid The operation is neither difficult nor dangerous The same result would be obtained by resection of the superior cervical ganglion, but the latter would interfere with other sympathetic functions

If the hyperhidrosis extends to the face and neck the interruption in the sympathetic chain should be made between the superior and middle cervical

ganglia It then results in anhidrosis of the head and neck down to the first intercostal space This operation involves simply isolation of the sympathetic chain below the large vessels of the neck at the level of the hyoid bone

When anhidrosis of the head, neck, and upper extremity is desirable, the section should be made at the lower pole of the stellate ganglion This is reached by the anterior approach between the two insertions of the sternomastoid muscle

In hyperhidrosis of the lower extremities the transperitoneal approach is imperative Section of fibers to the foot and leg is best done in the internodal fiber between the second and fourth lumbar ganglia When the hyperhidrosis is limited to the feet, the section may be performed at a level between the fourth and fifth vertebrae In conclusion the author says that recent studies of the sympathetic system have led to considerable progress in the field of functional surgery

A LOUIS ROSI, M D

# SURGERY OF THE CHEST

## CHEST WALL AND BREAST

Cohn, L. C.: Chronic Lactation Mastitis, Suppurative and Non-Suppurative. *Am J Cancer* 1933 xvi, 487

Cohn states that a distinct lump in the breast is either clinically malignant or clinically benign. An early sign of malignancy is dimpling of the skin over the tumor. The neoplasm is considered to be of the mastitis type if it feels like the caked breast of a nursing woman. If such a mass is associated with lactation and accompanied by fever and leucocytosis, exploration is indicated on the diagnosis of lactation mastitis. It may be found to be a solid non-encapsulated area firmer than the surrounding breast tissue. If operation is delayed the induration may disappear spontaneously undergo suppuration, or remain as a residual tumor.

Chronic lactation mastitis is characterized microscopically by lactation hypertrophy associated with infection. It has frequently been interpreted as cancer on microscopic examination. It must be differentiated also from the pseudolactation hypertrophy sometimes seen in carcinomas.

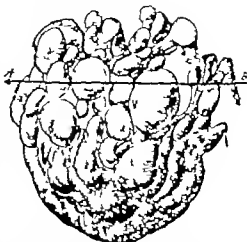
A residual tumor mass may be found very soon or some time after lactation mastitis. Areas of residual lactation hypertrophy may be present in a breast many years after lactation.

The incidence of chronic lactation mastitis is 1.5 per cent. Of the forty three cases studied by the author twenty-four were in the stage of abscess or sinus formation. A supporting sinus excludes cancer of the breast unless it is due to an operative procedure such as the insertion of radium needles. In twenty of the cases reviewed there was no abscess. In fifteen of these the complete cancer operation was done, and in five only the tumor was excised. In none was any evidence of cancer found in sections.

J. DANIEL WILLIAMS, M.D.

Moore, P.: Arborescent and Proliferating Adenofibroma of the Breast (L'adénome-fibrome arborescent et proliférant du sein). *Bull of med Soc. nat. de bor* 1933, lvi, 200

Moore calls attention to a peculiar type of benign tumor of the breast which clinically and macroscopically may give the impression of malignancy. Biopsy proves the neoplasm to be benign, but after its removal recurrence eventually develops. Moore reports a case in which operation was performed for a tumor of this type in the upper part of the breast. The neoplasm appeared to be encapsulated, but only the upper portion could be excised. In the lower portion there were long ramifications and extensions which, in the macroscopic sections, resembled isolated metastatic nodules.



Geometrical reconstruction of the tumor with its smooth and regular upper portion below and its arborescent deep portion above.

Recurrence is due, not to malignancy but to incomplete removal. In all cases the recurrent tumor was also proved to be benign by histological examination. The arborescence and proliferation were due to an exaggerated tendency toward budding which is noted in many adenofibromata of the breast.

The simple excision of Velpess and Mercet is not recommended for such tumors. The neoplasm must be completely removed. This may be done without causing undue mutilation by using a submammary or peripolar incision.

These arborescent proliferating tumors are not all of the same histological type. Of the two reported by the author one was a pericanalicular adenofibromyxoma and the other a papillary adenofibroma.

DAVID S. MOORE.

Levin, I. Radiotherapy and Surgery in Advanced Cancer of the Breast. *J Am. M. Ass.* 1934 xlviii, 977

In carcinoma of the breast, metastases to lymph nodes, lungs, skeleton and liver occur frequently and in the early stages of the disease. Surgical removal of the carcinoma does not endanger vital organs and prevents further metastatic transportation of tumor tissue.

Different types of breast cancer show great variations in the frequency of metastases. A scirrhous carcinoma may remain localized for years, while a medullary carcinoma may cause death in a few weeks. In some cases a recurrence may develop soon

after radical removal without the development of metastatic growths, while in others, distant metastases may occur as late as twenty years after operation without the development of a local recurrence.

A secondary metastatic tumor forms only when the transported cells succeed in overcoming the inhibitory power of the normal tissues where they have located. Otherwise they are surrounded by a connective tissue barrier and destroyed. In giving prophylactic irradiation it is not necessary to kill the cells, it is sufficient merely to suppress their proliferating power.

In 1929 a committee of the American College of Surgeons reached the conclusion that roentgen treatment does not improve the results of radical surgery in the early cases, but is of definite value in the treatment of recurrences. In the author's opinion these obviously contradictory conclusions can be explained only by supposing that in the cases studied the prophylactic irradiation was given in insufficient and variable amounts and the recurrences were irradiated properly.

In cancer of the breast the histological grading of malignancy outlined by Broders is less satisfactory than clinical grading. Advanced cases are classified in the following eight groups: (1) primary tumor movable over the chest wall and axillary lymph nodes involved, (2) similar to Group 1, but with involvement of supraclavicular or infraclavicular lymph nodes, (3) similar to Group 2, but with ulceration of the primary tumor, (4) primary tumor attached to the chest wall, (5) local recurrence after radical mastectomy, (6) metastases in the lungs, (7) metastases in the skeleton, and (8) metastases in the liver. Each of these groups requires a different therapeutic technique.

In the first group, with metastases in the axillary lymph nodes, surgery alone succeeds in only 16 per cent of the cases. When both the breast tumor and the tumor in the axilla are freely movable the case is operable and immediate radical mastectomy should be done. Pre-operative irradiation is contra-indicated, but postoperative irradiation should be begun immediately after the operation. Buried capillaries of radon should be placed in the axilla and the parasternal regions and this treatment followed by a course of high-voltage roentgen irradiation and the surface application of radium. A small percentage of the patients may be cured. Others may be kept well and active for several years, until a short time before death occurs from pulmonary or other metastases. In the cases of the remainder, cure is impossible, but palliative treatment will prolong life and allow a useful or comfortable existence.

In the second group of cases, with a movable primary tumor, radical mastectomy should be followed by immediate irradiation of the involved supraclavicular or infraclavicular glands.

In the third and other groups, chief reliance should be placed on irradiation with surgery as an occasional adjunct. Operation is indicated if a tumor

attached to the chest wall becomes movable, but not when it remains fixed, and should be preceded and followed by irradiation.

When metastases are present in the lung and skeleton, irradiation occasionally gives good temporary results. Metastases to the liver and generalized carcinomatosis are beyond any therapy.

C. S. PLATT, M.D.

Pack, G. T. The Interstitial Use of Gold-Filtered Radon Transfixion Tubes in the Treatment of Mammary Cancer. *Am. J. Roentgenol.*, 1932, xxvii, 532.

The author was led to use the method here described by the following facts:

1. For certain lesions the cancericidal dose has been determined fairly accurately. For intra-oral epidermoid carcinoma it is from 8 to 10 skin-erythema doses and for carcinoma of the breast it is from 12 to 13 skin-erythema doses. These dosages are based upon radiation delivered to the tumor, which is considered as a sphere with a diameter equalling the greatest diameter of the tumor.

2. The accurate implantation of gold radon seeds in neoplasms of any great size is extremely difficult.

3. Fairly successful results were obtained in the treatment of over 100 breast cancers by combined external and interstitial radiation. Incomplete destruction of portions of the tumor in a few of these cases was due to remoteness of the cancer cells from the buried radon.

4. Errors of placement of gold radon implants are often responsible for failure to destroy the tumor completely. Such errors are avoidable.

In attempts to deliver a lethal dose to all parts of the breast containing a non-palpable tumor the use of linear point sources of radiation seemed to offer a chance for more accurate placement and more diffuse distribution. The diffuse radiation obtained from such linear points is more suitable for the breast and adjacent lymphatic areas than intense focal irradiation within the tumor itself. Therefore in the procedure described by the author, radiation is given with radon in long capillary tubes with a 0.3-mm. wall, the lengths of which are adapted to the size of the breast or the dimensions of the area to be irradiated. These hollow wires are sealed at each end and attached to waxed silk threads to facilitate their withdrawal. They are inserted through trocar needles with the threads projecting from the hilts. The tumor, the breast, and the axilla or other areas to be irradiated are transfixured by the needle. The needle is then withdrawn, the capillary tube being left in place with the thread protruding. As a rule the wires are distributed throughout the tumor, beyond its palpable margin, and to any vulnerable points in the draining lymphatics in a gridiron arrangement. For the average breast and tumor from 13 to 16 tubes are used. In the typical distribution from 4 to 6 tubes are arranged in 3 planes, anteroposteriorly, transversely, and verti-

cally. The axilla is usually treated with 3 tubes 10 cm. long or 6 tubes 5 cm. long arranged fanwise and introduced from below upward or downward from the clavicular region. Axillary nodes receive supplementary treatment with a local intensity brought about with gold radon seeds of the ordinary type. The paramammary regions are treated with additional gold tubes. One tube is placed parallel with and below the clavicle, another diagonally against the junction of the breast and epigastrium, and a third along the lower border of the pectoral fold. Then, and perhaps most important of all, several tubes 2.0 cm. long, are introduced into each intercostal space near the sternal margin.

The average gold capillary tube has an initial content of from 15 to 2.0 mc. of radon to each centimeter of length. From 100 to 200 mc. are inserted into the breast and draining lymphatics. The tubes are withdrawn after the desired amount of radon gas has decayed. Experience has shown that from 30 to 35 mc. destroyed are administered to each of the other paramammary regions.

While in the use of buried radon implants the radiation is continuous until the radon is entirely consumed, in the use of the capillary wires described the dosage is terminated upon removal of the wires. The latter method therefore makes it possible to study the relative merits of the use of a large quantity of radon for a short time and of a small quantity of radon for a long time giving the same total dosage.

The reaction to the treatment is rather severe, the whole region becoming red and oedematous but while it is diffuse and widespread, it subsides and the breast remains flexible and elastic though of firmer texture. The scarring in the axilla does not impair motion. The postirradiation fibrosis is desirable as it may enclose viable carcinoma cells for a number of years in an inactive state. Such results are of assistance in inoperable advanced lesions, but in cases of lesions which are operable complete destruction of the tumor is the only satisfactory end-result.

The form of irradiation described should not be used if subsequent surgery is contemplated as the scarring will prevent adequate exposure and the fibrosis will delay wound healing. The procedure is a substitute for surgery rather than a pre-operative measure.

The described method of radiation has been used in the cases of 15 patients, 7 of whom had as in operable lesion and 8 of whom had an operable carcinoma of the breast. Five of the tumors, which measured 14, 12, 7, 6½ and 6 cm. in diameter have disappeared completely.

The article contains diagrams of the distribution of the gold capillaries, photographs of lesions before treatment and during the reaction, tables giving the histories, the technique, and the results in the 15 cases reported, and roentgenograms showing the distribution of the radon during the treatment.

A. JAMES LARSEN, M.D.

Mahler G. E.: The Results of Radiation Therapy in 1,822 Private Cases of Carcinoma of the Breast from 1902 to 1928. *Am. J. Roentgenol.* 1928, 22:462, 467.

Radiation is of value in the treatment of carcinoma of the breast. However good results depend upon the skill and clinical judgment of the radiologist to the same degree that good results from surgical treatment depend upon the skill and judgment of the surgeon rather than upon the instruments employed.

The author reviews 1,822 cases treated in his private clinic up to the year 1928. Although radium has a greater local effect in cancer than the X-ray none of these cases was treated with radium alone and only a small number received radiation. As radium. For widespread and deep effects the author prefers the X-ray. During the twenty-six years covered by this report constant changes and improvements were made in the technique and the results were improved. Further improvement in the results may be expected when the Kerpas technique of radium treatment is combined with other methods. As surgical statistics do not include inoperable cases and radiation statistics include practically all types of cases, a fair comparison of the results of surgical and radiation treatment is impossible.

In addition to the skill and clinical judgment of the radiologist the end-results of radiation treatment of breast cancer depend upon the extent of the disease, the type of the cells and the rate of growth of the tumor, and the patient's age.

In a review of the literature Portmann found that the natural duration of cancer of the breast averages thirty-four months. In the author's cases the duration of the condition was eighty-five months—sixteen and two-tenths months before treatment and sixty-eight and eight-tenths months after treatment. Portmann found that in cases treated by thirty-two surgeons the incidence of three-year cure was 35.6 per cent, the incidence of five-year cure 23.8 per cent, and the incidence of recurrence within one year after operation 25 per cent.

In 9 per cent of Mahler's cases attention was first attracted to the breast by tumor, pain, or injury. In the total number the time between the appearance of symptoms and treatment averaged sixteen and two-tenths months. Recurrence develops within a few weeks after removal is attributed by Mahler to incompleteness of the operation. In the cases reviewed, 64 per cent of the recurrences developed within the first year and 47 per cent within the first six months. The average length of time between the operation and recurrence was sixteen and nine-tenths months, and the longest eighteen years. The average interval between the first sign of recurrence and the beginning of radiation treatment was six and eight tenths months. The author believes that many if not most, recurrences would be prevented if postoperative radiation were given promptly. In the cases reviewed

the average interval between operation and post-operative radiation was twenty-two and seven-tenths months. When operation for recurrence is advisable it should be preceded by radiation.

In 271 of the cases reviewed no histological examination was made. In 147 of these there was no doubt in the mind of the surgeon regarding the diagnosis. Of the remaining 124 cases, in which operation was refused or contra-indicated, the diagnosis was doubtful in only 13. In 18 cases a diagnosis of fibro-adenoma was made, but a recurrent carcinoma developed. The mistaken histological diagnoses exceeded the number of doubtful clinical diagnoses the former numbering 18 and the latter 13.

Nine per cent of the patients received both pre-operative and postoperative radiation and 25 per cent were referred for postoperative radiation. Forty-three per cent were referred because of recurrences or metastasis following radiation. Six per cent were treated by radiation while the tumor was still in the operable stage. A number of inoperable cases were rendered operable by radiation. In the cases given postoperative radiation the incidence of five-year cure was 55 per cent. In 191 cases of advanced carcinoma, it was 46.6 per cent, which is twice the incidence of five-year recovery following treatment by surgery alone. Of the patients whose condition was inoperable when they were first seen by the author, 30 per cent were still alive after five years. In the total number of cases the incidence of five-year cure was 20 per cent. Since 1922 it has been 40 per cent, whereas previous to that year it was 33 per cent.

There is no standard technique for radiation treatment. Each case must be treated according to its own requirements. The best results will be obtained by the radiologist with the greatest knowledge. It is thought that the results may be improved by the intensive use of radium by the interstitial method or by surface application. Lack of radium has prevented the development of this method. When the tumor is movable and confined to the breast a five-year cure is obtained by surgery alone in 75 per cent of the cases and the results are little improved by the addition of radiation. However, in the great majority of cases the disease has passed this stage. In the latter, a five-year cure is obtained in 24.5 per cent when surgery is used alone and in 37 per cent when surgery and radiation are combined. In the author's cases the incidence of five-year cure was 46.6 per cent, an increase of 90 per cent over the average incidence of five-year cure after surgery alone.

In charts the author shows the incidence of three-year and five-year survival to be as follows:

Three-year survival: no treatment, 24 per cent, incomplete operation, 29 per cent, complete operation without radiation, 51 per cent, and complete operation and skillful radiation, 66 per cent.

Five-year survival: no treatment, 12 per cent, operation alone, 35 per cent, and operation combined with radiation, 55 per cent.

The author concludes that when surgery is combined with radiation the chances of cure are nearly twice as good as when surgery is used alone.

A. JAMES LARKIN, M.D.

## TRACHEA, LUNGS, AND PLEURA

Douady, D., and Meyer, A. The Intrapleural Section of Adhesions in Artificial Pneumothorax. The Jacobaeus Operation (La section intrapleurale des adhérences dans le pneumothorax artificiel. Opération de Jacobaeus). *Arch. med.-chir. de l'appar. respir.*, 1931, VI, 432.

The authors review the history of the Jacobaeus operation and describe the different parts of the Jacobaeus-Unverricht apparatus, the use of the cautery, and the variations adopted by several workers in the use of the high-frequency or coagulating electrode.

They believe that pleuroscopy should not be undertaken until the pneumothorax has been present for at least three months because before that length of time the complete possibilities of pneumothorax treatment cannot be determined. The procedure is indicated only when tubercle bacilli are present in the sputum. Absence of a pleural effusion is desirable, but not essential. It may be advisable to aspirate the pleura two or three days before the examination. The condition of the other lung should be considered in determining the indications as an active lesion may be lighted up by an intervention in the contralateral pleural cavity. Before pleuroscopy is undertaken the attempt must be made to obtain the maximum pneumothorax.

The roentgen appearance of the adhesions is also important. Pleural endoscopy will give exact information regarding the number and situation of the adhesions, their conformation, their attachments to the lung and parietes, and their connection to vessels. Several types may be recognized: (1) string-like adhesions, (2) cords, which sometimes may be as large as a thumb, (3) veils and thin membranes, and (4) dense membranes or diaphragms without free borders and continuing directly into an adhesion zone. The dense membranes are found most frequently in the paravertebral region. Their section is necessarily incomplete, but sometimes is followed by excellent results.

Too close proximity of the mediastinal vessels is a contra-indication to the operation.

The condition of the pleura offers a certain amount of information with regard to the prognosis. When the pleura is healthy and the pneumothorax has been induced recently the prognosis is good. An acute pleural irritation with diffuse hyperaemia indicating a particularly active state does not necessarily mean an unfavorable prognosis, but in the presence of such a condition a temperature reaction and effusion are to be expected. When the pleura is thick, whitish, and fibrinous, there is apt to be postoperative inertia of the liberated lung. When numerous tubercles and adhesions over the



cally. The axilla is usually treated with 3 tubes 10 cm. long or 6 tubes 6 cm. long arranged fanwise and introduced from below upward or downward from the clavicular region. Axillary nodes receive supplementary treatment with a focal intensity brought about with gold radon seeds of the ordinary type. The paramammary regions are treated with additional gold tubes. One tube is placed parallel with and below the clavicle, another diagonally against the junction of the breast and epigastrium, and a third along the lower border of the pectoral fold. Then, and perhaps most important of all, several tubes 30 cm. long are introduced into each intercostal space near the sternal margin.

The average gold capillary tube has an initial content of from .5 to 2.0 mc. of radon to each centimeter of length. From 100 to 200 mc. are inserted into the breast and draining lymphatics. The tubes are withdrawn after the desired amount of radon gas has decayed. Experience has shown that from 30 to 35 mc. destroyed are administered to each of the other paramammary regions.

While in the use of buried radon implants the radiation is continuous until the radon is entirely consumed, in the use of the capillary wires described the dosage is terminated upon removal of the wires. The latter method therefore makes it possible to study the relative merits of the use of a large quantity of radon for a short time and of a small quantity of radon for a long time giving the same total dosage.

The reaction to the treatment is rather severe the whole region becoming red and oedematous, but while it is diffuse and widespread, it subsides and the breast remains flexible and elastic though of firmer texture. The scarring in the axilla does not impale motion. The postirradiation fibrosis is desirable as it may enclose viable carcinoma cells for a number of years in an inactive state. Such results are of assistance in inoperable advanced lesions, but in cases of lesions which are operable complete destruction of the tumor is the only satisfactory end-result.

The form of irradiation described should not be used if subsequent surgery is contemplated as the scarring will prevent adequate exposure and the fibrosis will delay wound healing. The procedure is a substitute for surgery rather than a pre-operative measure.

The described method of radiation has been used in the cases of 13 patients, 7 of whom had an operable lesion and 6 of whom had an operable carcinoma of the breast. Five of the tumors, which measured 14, 13, 7, 6½ and 6 cm. in diameter have disappeared completely.

The article contains diagrams of the distribution of the gold capillaries, photographs of lesions before treatment and during the reaction, tables giving the histories, the technique and the results in the 5 cases reported, and roentgenograms showing the distribution of the radon during the treatment.

A. JAMES L. KERRY, M.D.

Mahler G. K.: The Results of Radiation Therapy in 1022 Private Cases of Carcinoma of the Breast from 1903 to 1928. *Am. J. Surg.* 1932, XXXI, 497.

Radiation is of value in the treatment of carcinoma of the breast. However good results depend upon the skill and clinical judgment of the radiologist to the same degree that good results from surgical treatment depend upon the skill and judgment of the surgeon rather than upon the instruments employed.

The author reviews 1,022 cases treated in his private clinic up to the year 1928. Although radium has a greater local effect in cancer than the X-ray none of these cases was treated with radium alone and only a small number received radium. As radium. For widespread and deep effects the author prefers the X-ray. During the twenty-six years covered by this report constant changes and improvements were made in the technique and the results were improved. Further improvement in the results may be expected when the Keynes technique of radium treatment is combined with other methods. As surgical statistics do not include inoperable cases and radiation statistics include practically all types of cases, a fair comparison of the results of surgical and radiation treatment is impossible.

In addition to the skill and clinical judgment of the radiologist the end results of radiation treatment of breast cancer depend upon the extent of the disease, the type of the cells and the rate of growth of the tumor, and the patient's age.

In a review of the literature Portmann found that the natural duration of cancer of the breast averages thirty-four months. In the author's cases the duration of the condition was eighty-five months—sixteen and two-tenths months before treatment and sixty-eight and eight-tenths months after treatment. Portmann found that in cases treated by thirty-two surgeons the incidence of three-year cure was 54.4 per cent, the incidence of five-year cure 38.8 per cent, and the incidence of recurrence within one year after operation 5 per cent.

In 93 per cent of Mahler's cases attention was first attracted to the breast by tumor pain, or injury. In the total number the time between the appearance of symptoms and treatment averaged sixteen and two-tenths months. Recurrence developing within a few weeks after removal is attributed by Mahler to incompleteness of the operation. In the cases reviewed, 64 per cent of the recurrences developed within the first year and 43 per cent within the first six months. The average length of time between the operation and recurrence was nineteen and nine-tenths months, and the longest eighteen years. The average interval between the first sign of recurrence and the beginning of radiation treatment was six and eight-tenths months. The author believes that more than 75 per cent of recurrences would be prevented if postoperative radiation were given promptly in the cases reviewed.

the average interval between operation and post-operative radiation was twenty-two and seven-tenths months. When operation for recurrence is advisable it should be preceded by radiation.

In 271 of the cases reviewed no histological examination was made. In 147 of these there was no doubt in the mind of the surgeon regarding the diagnosis. Of the remaining 124 cases, in which operation was refused or contra-indicated, the diagnosis was doubtful in only 13. In 18 cases a diagnosis of fibro-adenoma was made but a recurrent carcinoma developed. The mistaken histological diagnoses exceeded the number of doubtful clinical diagnoses, the former numbering 18 and the latter 13.

Nine per cent of the patients received both pre-operative and postoperative radiation and 25 per cent were referred for postoperative radiation. Forty-three per cent were referred because of recurrences or metastasis following radiation. Six per cent were treated by radiation while the tumor was still in the operable stage. A number of inoperable cases were rendered operable by radiation. In the cases given postoperative radiation the incidence of five-year cure was 55 per cent. In 101 cases of advanced carcinoma, it was 46.6 per cent, which is twice the incidence of five-year recovery following treatment by surgery alone. Of the patients whose condition was inoperable when they were first seen by the author, 30 per cent were still alive after five years. In the total number of cases the incidence of five-year cure was 20 per cent. Since 1922 it has been 40 per cent, whereas previous to that year it was 33 per cent.

There is no standard technique for radiation treatment. Each case must be treated according to its own requirements. The best results will be obtained by the radiologist with the greatest knowledge. It is thought that the results may be improved by the intensive use of radium by the interstitial method or by surface application. Lack of radium has prevented the development of this method. When the tumor is movable and confined to the breast a five-year cure is obtained by surgery alone in 75 per cent of the cases and the results are little improved by the addition of radiation. However, in the great majority of cases the disease has passed this stage. In the latter a five-year cure is obtained in 24.5 per cent when surgery is used alone and in 37 per cent when surgery and radiation are combined. In the author's cases the incidence of five-year cure was 46.6 per cent, an increase of 90 per cent over the average incidence of five-year cure after surgery alone.

In charts the author shows the incidence of three-year and five-year survival to be as follows:

Three-year survival: no treatment, 24 per cent, incomplete operation, 20 per cent, complete operation without radiation, 51 per cent, and complete operation and skillful radiation, 66 per cent.

Five-year survival: no treatment, 12 per cent, operation alone, 35 per cent, and operation combined with radiation, 55 per cent.

The author concludes that when surgery is combined with radiation the chances of cure are nearly twice as good as when surgery is used alone.

A. JAMES LARKIN, M.D.

## TRACHEA, LUNGS, AND PLEURA

Douady, D., and Meyer, A. The Intrapleural Section of Adhesions in Artificial Pneumothorax. The Jacobaeus Operation (La section intrapleurale des adhérences dans le pneumothorax artificiel. Operation de Jacobaeus). *Arch. med. et de l'appar. respir.*, 1931, vi, 432.

The authors review the history of the Jacobaeus operation and describe the different parts of the Jacobaeus-Unverricht apparatus, the use of the cautery, and the variations adopted by several workers in the use of the high-frequency or coagulating electrode.

They believe that pleuroscopy should not be undertaken until the pneumothorax has been present for at least three months because before that length of time the complete possibilities of pneumothorax treatment cannot be determined. The procedure is indicated only when tubercle bacilli are present in the sputum. Absence of a pleural effusion is desirable, but not essential. It may be advisable to aspirate the pleura two or three days before the examination. The condition of the other lung should be considered in determining the indications as an active lesion may be lighted up by an intervention in the contralateral pleural cavity. Before pleuroscopy is undertaken the attempt must be made to obtain the maximum pneumothorax.

The roentgen appearance of the adhesions is also important. Pleural endoscopy will give exact information regarding the number and situation of the adhesions, their conformation, their attachments to the lung and parietes, and their connection to vessels. Several types may be recognized: (1) string-like adhesions, (2) cords which sometimes may be as large as a thumb, (3) veils and thin membranes, and (4) dense membranes or diaphragms without free borders and continuing directly into an adhesion zone. The dense membranes are found most frequently in the paravertebral region. Their section is necessarily incomplete, but sometimes is followed by excellent results.

Too close proximity of the mediastinal vessels is a contra-indication to the operation.

The condition of the pleura offers a certain amount of information with regard to the prognosis. When the pleura is healthy and the pneumothorax has been induced recently the prognosis is good. An acute pleural irritation with diffuse hyperemia indicating a particularly active state does not necessarily mean an unfavorable prognosis, but in the presence of such a condition a temperature reaction and effusion are to be expected. When the pleura is thick, whitish and fibrous, there is apt to be postoperative inertia of the liberated lung. When numerous tubercles and adhesions over the

pleura and lung, caseous masses, and a thick or purulent fluid are found, operation is associated with danger but may offer the only chance of obliterating a cavity which is threatening life.

The choice of the route of entrance into the chest depends on the X-ray findings. As a rule the endoscope is introduced along the anterior axillary line. After a direct study of the interior of the cavity the cautery or electrode is introduced at a selected point. Some surgeons practice sounding as soon as the pleural cavity is entered. In this procedure the trocar is withdrawn from the thoracoscope as soon as the pleura has been pierced and the blunt sound is introduced until it meets resistance of the lung. In this way the distance of the lung from the chest wall is determined exactly.

The adhesions are divided as close to the pleura as possible or the parietal pleura is infiltrated with novocain by means of a long needle and the attachment of the adhesions to it are scooped out. However the latter procedure increases the risk of hemorrhage. Hemorrhage should be carefully guarded against. All bleeding should be stopped with the cautery at low heat or by coagulation.

The day after the operation it is necessary to increase the pneumothorax or if the pressure is too great to decrease it.

In some cases there may be a diffusion of the gas from the pneumothorax with resulting subcutaneous emphysema. This is unfavorable as it allows re-expansion of the lung and the formation of acute postoperative adhesions. The most frequent post-operative complications are collections of fluid within the pleura. As a rule the fluid disappears after several days or may be aspirated. Occasionally it becomes purulent. This change may be due to tuberculous pleurisy or rarely a superimposed secondary infection. The most serious complication is rupture of the lung, which always results in empyema of a fulminating type.

In 1925 Jacobson reported on 115 cases in which intrapleural section of adhesions was done. In 95 the results were good from a technical standpoint and in 76 they were successful from a clinical standpoint. Graeven has followed 47 patients for from one to five years. Sixty five per cent were able to return to work. In 1930, Heyman reported the results of 200 operations performed in a period of two years. The results were technically good in 91.9 per cent. Rapid clinical improvement was obtained in 9.4 per cent and slow clinical improvement in 71 per cent. In 465 cases of pneumothorax, Poonipon found pleuroscopy indicated in 93. Of 65 of the latter in which the adhesions were divided, complete collapse with disappearance of the tubercle bacilli from the sputum was obtained in 75 per cent.

FRANK B. BERRY, M.D.

### HEART AND PERICARDIUM

Bigger, I. A.: *Concretio Cordis. II. Cardialis de her Concretio Cordis. Arch Surg* 1925, 207-574

Bigger has resected the pericardial scar in two cases of concretio cordis. In the first case the chamber of the right ventricle was opened in an area of muscle atrophy. The hemorrhage was abundant but was controlled by resuture of the pericardium as only a small portion had been actually resected. The patient died about twelve hours after the operation. In the second case the thickened pericardium was removed from the anterior surface of the heart with a satisfactory result. Subsequent laparotomy revealed tuberculous peritonitis, but no tubercles were demonstrable in the pericardial scar.

The author recommends sharp dissection and direct vision in the freeing of the scar tissue from the wall of the heart. The pericardium should not be cut away until the end of the operation as it may be useful to close the defect if a chamber of the heart is opened.

EDWARD D. CRITCHFIELD, M.D.

# SURGERY OF THE ABDOMEN

## ABDOMINAL WALL AND PERITONEUM

Sigalas, M. Postoperative Eventration (Explanchnose postoperative) *Revue de chir.*, Par., 1932, 11, 32

Sigalas describes a rupture of the abdominal incision occurring ten days after a subtotal hysterectomy. He has been able to collect 7 other cases observed by his colleagues.

He states that postoperative eventration may occur early or as late as twelve years after operation. It may occur at any age. It is more frequent in women than in men. Of 157 cases, 127 were those of women. Laparotomies below the umbilicus are followed by eventration more frequently than laparotomies above the umbilicus. Of 150 eventrations, 132 followed a subumbilical incision, 9, a supra-umbilical incision, and 9, a lateral incision. Midline incisions are followed by eventration more frequently than lateral incisions. The time of removal of the skin sutures, the suture material left in the deep layers, and the presence of drainage are not causative factors, but a poor condition of the abdominal wall, the presence of a hematoma or suppuration, and sudden and repeated contractions of the abdominal muscles such as occur in coughing, vomiting and straining at stool are of importance. General causes such as cancer and syphilis may retard cicatrization, but are not of prime importance.

As a rule there is a sudden discharge through the dressing but hardly any pain. The protruding viscera should be rinsed with normal salt solution and replaced, and the abdominal wall approximated with metal sutures passed through all of the layers or with heavy silk sutures. Drainage of the abdominal wound with sterile gauze is important. As a preventive, tight abdominal bandages should be used. In the cases of debilitated patients, the stitches should not be removed before two weeks; the patient should be kept in bed much longer, and when he gets up he should wear an abdominal support. Coughing should be prevented if possible, and light bowel movements facilitated.

In 161 cases of early eventration collected from the literature the mortality was 18.5 per cent. In the cases of late eventration there were no deaths.

GEZA DE TAKATS, M.D.

Moorhead, J. J. Traumatic Inguinal Hernia *J. Am. Med. Ass.*, 1932, xcvi, 1785

The author discusses the relationship between injury and hernia. He attributes hernia to the presence of a sac, either congenital or preformed, which represents an attempt of the body to buttress a weak area in the abdominal wall with peritoneum. He

believes that the formation of hernia is not related to any one injury, but may be aggravated by injury. The most important factor is intra abdominal pressure. If the formation of a hernia were an immediate occurrence, local pain, swelling, tenderness, and disability would be present in proportion to the increase in size of the hernia. Such physical signs are absent. Other proofs of the chronicity of the formation of hernia are the findings of pathological examination. In the 232 cases reviewed by the author the constant finding was chronic peritonitis. It would require at least a year of irritation to convert normal peritoneum to the state usually encountered in hernial formation. Moorhead has never noted hernia as a complication of trauma of any type, even crushing abdominal and chest injuries.

In the author's cases of hernia in working men the incidence of recurrence is approximately 9 per cent. Most recurrences develop within the first six months after operation, but no estimate of the success of an operation is worth much until five years have elapsed. Moorhead allows the patient to get out of bed on the eighth day after operation, to return to light work two weeks after he leaves the hospital, and to resume full work four weeks after he leaves the hospital. J. THORNTON WITHERSPOON, M.D.

Robb, J. J. The Sympathetic in Acute General Peritonitis. A Clinical Study with Observations on Treatment. *Brit. J. Surg.*, 1932, xiv, 634

Robb attempts to explain the clinical manifestations of peritonitis on the basis of a disturbance in the sympathetic innervation. In the majority of cases the ileus associated with peritonitis is not of the mechanical variety. Distention of the gut early in peritonitis involves largely the small bowel. The duodenum and jejunum are distended most markedly, but later the ileum may become involved. Interference with motility is especially apt to occur at the physiological sphincters, viz., pylorus, duodeno-jejunal junction, and ileocecal region. Robb believes that at these points there is a hyperactive sphincteric control associated with paralysis and distention of the gut produced by sympathetic stimulation from peritoneal irritation.

The treatment of peritonitis should be directed toward (1) treatment of the peritoneum itself, (2) treatment of the hyperactive sympathetic system, and (3) replenishment of the body's chlorides and fluids. As regards the peritonitis itself the avoidance of unnecessary trauma is especially important. To combat the hyperactivity of the sympathetic system simple drainage is indicated. The administration of  $\frac{1}{2}$  gr. of morphine every four hours after the operation is recommended. Gastric lavage is imperative to maintain the patient's

strength. The early administration of fluid by mouth or rectum is condemned because it aggravates the vomiting. Moreover attempts to replace fluids early are futile because fluids are lost by perspiration and vomiting.

It is often difficult to determine just how long to continue with conservative therapy. However the appearance of pus in a wound or in the drainage usually indicates improvement. When this is noted, replenishment of fluids may be attempted. In the cases of patients who are in extremis a sign of improvement is the objective sensation of warmth. To combat the hyperirritability of the sympathetic system the opium is stopped and 1/100 gr. of atropin is administered every four hours. Following gastric lavage peristalsis is stimulated by the administration of raw meat juice. From 1 to 2 pt. of normal saline solution and a per cent gum acacia are given intravenously. When improvement begins the first enema is given. Atropin has no action on the normal tone of sphincters, but abolishes sphincteric hypertonus. Pilocarpin should never be used as it increases sphincteric hypertonus.

The treatment described has been used in thirty cases of general peritonitis including a case of pneumococcal peritonitis and two cases of puerperal peritonitis. There was one death from bronchopneumonia.

ALTON OCHSNER, M.D.

### GASTRO-INTESTINAL TRACT

Martini, T., and Corruiter R. E.: Gastrotonometry in the Treatment of Leishasthenia of the Stomach (La gastrotonometria en el tratamiento de la leishasthenia del estómago). *Seminars Med.* 93 XXXI, 353.

In a previous article the authors reported the clinical results of gastrotonometry in 43 cases of gastric leishasthenia. In this article they report another case.

They believe that gastrotonometry is a valuable diagnostic prognostic and therapeutic measure in disturbances of the motor function of the stomach. It reveals hypotonicity of the gastric musculature before such hypotonicity is disclosed by roentgen examination. It is harmless, simple, and more rational than methods formerly used, and may give good results when all other treatments fail. In 50 per cent of the cases in which it is used the gastric tone is increased and anorexia ceases although there may be no increase in weight. In the majority of cases the use of a belt is unnecessary.

In three years the authors have had no accidents with the method although they have used it in over 100 cases. However they emphasize that it should be employed only in cases of true gastric hypotonicity or atonicity in which other disturbances, especially cancer and ulcer of the stomach, have been ruled out. In discussing the diagnosis, the authors emphasize the character of the pain associated with distention and atonicity of the stomach. The pain is localized

in the epigastrium and is fixed or radiates only slightly upward toward the esophagus. It occurs immediately or very soon after the ingestion of food and tends to cease spontaneously after one or two hours. It is usually increased when the patient is standing and tends to decrease or cease when he lies on his back or abdomen.

In discussing the X-ray as an aid to diagnosis the authors call attention to what they call a "radiological tonal discordancy" in which the X-ray evidence indicates atonicity, but the gastric tension is normal or high or the X-ray evidence indicates normal tonicity but the gastric tension is low. Is true gastric atonicity gastrotonometry shows the tension of the stomach to be low.

WILLIAM R. TOMASON, M.D.

Held, I. W., and Goldbloom, A. A.: Pyloric and Duodenal Stenosis. *Med. Clin. North A.* 1935, 27, 137.

Pyloric and duodenal stenosis is usually due to the formation of an excessive amount of connective tissue in the pylorus or duodenum which gives rise to a callous ulcer. Pyloric stenosis usually develops slowly and therefore occurs late in life. The clinical manifestations of pyloric stenosis due to a callous ulcer vary markedly according to the stage of the condition. However the stenosis may be classified according to the degree of obstruction.

Boss distinguishes three types of motor insufficiency depending upon the emptying time of the stomach after an average meal. Motor insufficiency of the first degree is characterized by an emptying time of approximately eight hours; that of the second degree, by an emptying time of from eight to twenty-four hours; and that of the third degree by an emptying time of more than twenty-four hours.

If motor insufficiency of the first degree the symptoms may be like those of peptic ulcer except that large meals cause distress, eructations and eructa do not give relief and the vomiting consists of food eaten from eight to ten hours previously.

In motor insufficiency of the second degree the symptoms may be less marked, but nausea usually precedes the vomiting and the pain is not completely relieved by vomiting. Relief from nausea and distress comes only after lavage of the stomach. At night, regurgitation of food into the esophagus may awaken the patient and lead to severe coughing spells. In motor insufficiency of the first degree and that of the second degree the physical findings are loss of weight, coating of the tongue, and protruding alveolaria. Examination of the abdomen discloses an enlarged stomach containing fluid and air. The diagnosis can be verified by the X-ray demonstration of retention.

In motor insufficiency of the third degree the stomach is seldom empty and the objective and subjective findings are very marked. Pain is no longer the important symptom. Constant distress is present throughout the abdomen, and there is obstinate constipation. Because of pronounced atony of the

stomach, vomiting is rare and relief is obtained only from gastric lavage. Dehydration and emaciation become marked. In this condition also the X-ray findings definitely determine the diagnosis. In the differential diagnosis it is necessary to rule out erosion of the pyloric sphincter, ulcerous pyloritis, pyloric stenosis due to caustic poisoning, hypertrophy of the pylorus, malignancy, gumma, multiple polyps, pressure from extragastric tumors, pyloric adhesions, and foreign-body stenosis. Pyloric stenosis may be complicated by acute hemorrhage and gastric tetany.

As a general rule the treatment should be surgical, but if this is impossible, medical treatment may be attempted. Medical treatment consists of gastric lavage with a pint of lukewarm water, a liquid diet, the administration of atropin, and, if possible, jejunal feedings.

SAMUEL J. FOGELSON, M.D.

Draper, G., and Touraine, G. A. The Man-Environment Unit and Peptic Ulcer. *Arch Int Med*, 1932, xlix, 616.

The authors reviewed the histories of 32 families with a history of peptic ulcer and 32 families with a history of gall-bladder disease. Special attention was paid to race, morphological type, disease history, sex disturbances, and psychological makeup.

Seventy-five per cent of the relatives of the patients with ulcer were slender or of medium build, while 64 per cent of those of patients with gall-bladder disease were stocky or stout. In general the findings show that most of the members of families with a tendency to develop peptic ulcer are of slender or medium build whereas most of the members of families with a tendency to develop gall-bladder disease are stocky and stout.

From their genetic studies the authors draw the following conclusions:

1. There is a tendency for families with a history of peptic ulcer to produce a preponderance of males, and for families with a history of gall-bladder disease to produce a preponderance of females.

2. Persons with ulcer belong to families in which most of the members are of the long, thin type, whereas persons with gall-bladder disease belong to families in which most of the members are of the short, thick type.

3. In families with a history of ulcer there is definite evidence of a hereditary weakness of the gastro-intestinal tract, 62 per cent of the families reporting such a weakness.

4. Gastro-intestinal weakness is  $3\frac{1}{2}$  times more frequent in the males than in the females in these families, and almost without exception is found in thin persons. The males of these families are much less resistant to other diseases in the zone of the pneumogastric nerve (tuberculosis and pneumonia) than the females.

5. Diseases of a catabolic nature occur more frequently in families with a history of ulcer, and anabolic diseases more frequently in families with a history of gall-bladder disease.

Anthropometry and anthroposcopy in 125 cases suggested that peptic ulcer is definitely limited to the linear rather than the lateral type of person. Observations in this study showed clearly not only a physical and psychic type subject to ulcer disease, but one so well defined that "it is possible almost without error to determine from the individual's constitution whether the location of the ulcer is gastric or duodenal." In persons with a tendency to develop peptic ulcer the gonial angle (formed by the intersection of the posterior border of the ascending and the lower border of the horizontal rami) averages 124 degrees whereas in persons with a tendency toward gall-bladder disease it averages 115 degrees. The significant feature of the trunk and extremities of persons with peptic ulcer are a somewhat low anteroposterior diameter-chest length index, a narrow subcostal angle, relatively short arms, and eunuchoidal trunk-extremity ratio.

The psychic characteristic of persons with peptic ulcer is an exaggerated fear sense. Such persons are prone to swift and intense excitability and easily become fatigued, but recover their energy after short rest periods and the ingestion of food. The direction of their interest and attention is generally outward, like that of the classical extrovert. Beneath an outward manner of assurance they have a latent timidity. They are easily suggestible. The males display an exaggerated heterosexual interest, but show signs of antagonism toward their own sex. In the females interest in erotic experience is definitely diminished. The highly sensitive, feminine quality of temperament in the males has been recognized by earlier observers. Von Bergmann emphasized the strong emotional factor in the etiology of ulcer and urged physicians "not to be misled by the stolid men of the Holsteiner, beneath which the tension of emotional conflict may be terrific."

It seems that persons with peptic ulcer possess an inadequate sympathetic nervous system. The inadequacy may be due to inherited weakness or a wearing-out process. The gastric disturbances resemble those occurring in sympathetomized animals (Cannon).

The authors report 22 cases showing the described psychological and physical characteristics of persons with peptic ulcer. These suggest that the psychic and physical structure of the male is characterized by varying degrees of femaleness, an attribute to be suppressed as being detrimental to the establishment and maintenance of an adequate adjustment between the male personal inner man environment and adaptation to the physical universe. In the female the mechanism is similar. The female shows a strong tendency toward independence of action in life, she desires to dominate and direct the course of others and to assume responsibility. She manifests also a distinct decrease of sex interest.

The most feminine contours are found in persons with a tendency toward gall-bladder disease. In persons with gastric ulcer, femaleness is greatly

diminished. However the psychological reaction of these persons to the unconscious perception of their female component is apparently in inverse ratio to the actual content.

This review of 38 families with a history of peptic ulcer seems to indicate that the members of such families represent a definite constitutional type with qualities of soma and psyche which can be easily recognized. When the healthy balance of the "man-environment unit" is disturbed, symptoms in the domain of the sympathetic nervous system and gastro-intestinal tract develop. The disturbance of the man-environment unit can often be corrected by the use of appropriate psychotherapeutic methods. At the present time analytical psychology seems to offer the best approach.

SARRE J. FOGELSON M.D.

Garia, C., and Barron P.: The Use of Gastrophotography in the Diagnosis of Gastric Ulcer (*De l'utilisation de la gastrophotographie dans le diagnostic de l'ulcère gastrique*) *Bull. et mem. Soc. med. de chir.* 932, 1944, 36.

Gastrophotography is intended, not to replace roentgenography but for use as an adjunct to the latter in certain cases. It permits the diagnostician not only to see the ulcer but also to judge the state of the gastric mucosa. There are clinical cases approaching ulceration in which roentgenography is incapable of yielding information but photographic images are easily recognizable. Among these are certain cases of idiopathic gastritis, hemorrhagic gastritis in particular. SARRE J. FOGELSON M.D.

Atkinson, A. J. Gastric Mucin in the Treatment of Peptic Ulcer. *J. Am. M. Ass.* 93, April, 34.

Forty three patients with a history, signs, symptoms, laboratory evidence and roentgen manifestations of peptic ulcer were treated with gastric mucin. The average dose was 90 gm. per day. In the hospital group the scheme of management was as follows:

One hundred and twenty cubic centimeters of milk and cream with mucin were given hourly from 7 a.m. to 7 p.m., together with from one to five additional feedings of cereal, soft eggs, or custard. In addition, mucin was given in capsules or in water every hour from 7 a.m. to 9:30 p.m. although capsules were found to be inefficient as the contained mucin did not diffuse throughout the gastric contents.

Fifteen of the patients had not obtained relief from any type of previous treatment. The subjective symptoms were controlled by mucin therapy in an average period of one and seven-eighths days. The average hospitalization per patient was seventy one hundredths of a week.

The gastric acidity was studied hourly throughout the entire day while the patients were fed varying amounts of mucin. The results indicate that in vivo the buffering action of mucin does not vary directly with the amount of mucin fed, the subjective sym-

ptoms being controlled in this series although free acid was present during the mucin treatment.

Roentgen re-examination of patients on much treatment has shown a diminution of both the direct and indirect evidence of peptic ulcer.

SARRE J. FOGELSON, M.D.

Benedict, R. B.: A Clinicopathological Study of Carcinoma of the Stomach, Using Large Microscopic Sections and Dissecting the Lymphatic Spread. *Edinburgh M. J.* 1935, 2025, 243.

With the hope of throwing light on the pathology of carcinoma of the stomach and its relationship to the clinical findings, Benedict made a microscopic study of large sections of the stomach removed in twenty-nine partial gastrectomies and carefully charted the glandular spread.

Clinically the results in these cases were disappointing the operative and later mortality being high. The author attributes this fact to the tardiness of the disease and delay in the patient's entrance to the hospital. The average duration of gastric symptoms prior to hospital admission was nine months. Only eight of the twenty-nine patients are alive a year after the operation. Of these eight, five had symptoms less than three months, one less than five months, one for ten months, and one for twelve months. Six had no invasion of the lymph glands, one had invasion of the subpyloric group of glands, and died of gastric hemorrhage two and a half years after the operation, and one could not be traced after fourteen months. The most common symptoms were a sense of fullness, anorexia, nausea, vomiting, and epigastric pain. One patient had been subjected to posterior gastro-jejunostomy for gastric ulcer fourteen years previously. In the histories of the others there was no suggestion of previous ulcer. In most of the cases, gastric analysis showed absence of free hydrochloric acid after a test meal, and fluoroscopic examination revealed a filling defect with gastric retention six hours or more after a barium meal.

Forty-eight and three-tenths per cent of the patients died within a month after the partial gastrectomy. All but one of the eight who were living a year after the operation were over forty-eight years of age and were not cachectic.

The author believes that microscopic examination of small isolated sections of carcinomata of the stomach is quite likely to give an erroneous idea of the character of the tumor as a whole. In the cases reviewed large enough dual sections were taken through the body of the tumor and part of the normal gastric mucosa. These large sections are needed for the purpose of classifying the pathological changes and determining the degree of malignancy according to the method advocated by Broder. Ten desmocarcinomata presented no difficulty in their classification. Five tumors showed varying degrees of gland formation in some areas and diffuse invasion by epithelioid cancer cells with no tendency toward gland formation in others. Benedict classified these as adenospheroidal carcinomata. He

states that they may become more malignant as they vary from the normal structure. Eight tumors showed a purely spheroidal cell structure. Six were scirrhous carcinomata, presenting columns of cancer cells closely compressed by dense fibrous tissue. Others showed a combination of spheroidal cells and fibrous tissue. One was a fibrocarcinoma with diffuse invasion of the wall of the entire stomach. The author says that while, from the histological standpoint, it would seem reasonable to grade the highly undifferentiated spheroidal cancer as the most malignant, there is insufficient follow-up evidence in his small series of gastric cases to indicate that this is correct. Adenocarcinoma is probably less malignant than spheroidal-cell carcinoma. Scirrhous carcinoma appears histologically to be slow growing, but regularly invades lymph glands. Its malignancy is difficult to grade.

The study of the lymphatic spread in the cases reviewed was carried out by dissection of the lymph glands removed at operation. Each gland was numbered and the section later examined microscopically and recorded as malignant or non-malignant. Two hundred and ninety glands were thus examined. In 12 of the 29 cases there was no malignant spread to the lymphatic glands. Of the remaining 17 cases, the subpyloric glands were involved in 11, the glands on the lesser curvature in 10, those on the greater curvature in 6, the retropyloric glands in 5, and the celiac glands in 3. In general the glands involved were near the tumor. Most of the tumors being near the pylorus, the glandular involvement was usually in the pyloric region, either below the pylorus or along the lesser curvature. Very small glands which did not appear malignant on gross examination were quite frequently found to be malignant on microscopic examination, whereas fairly large glands which suggested malignancy on gross examination were sometimes found on microscopic examination to be benign.

EMIL C. ROBITSHEK, M.D.

Brown, P. W. Diarrhoea of Unknown Origin  
*Am J Surg*, 1932, xv, 483

Brown reviewed the records of more than 100 cases of diarrhoea of unknown origin.

Following careful taking of the history and general examination it is the practice at the Mayo Clinic to make a series of examinations of stools on two or preferably three successive days. In sigmoidoscopic examination experience is necessary to avoid making a diagnosis of proctosigmoiditis or ulceration when the changes present are the result of irrigations or injury from the enema tip. Roentgenography with the use of a barium enema is a much better means of determining the condition of the colon. However, the ileocaecal coil is best examined by roentgenography six hours after the administration of barium by mouth.

Brown believes that diverticulosis is seldom, if ever, a factor in diarrhoea. Rankin and Brown reported the incidence of diarrhoea in association

with diverticulitis as 11 per cent. In this condition it was not a true diarrhoea, but usually a rectal tenesmus with rather frequent passages of mucus, pus, and faeces due to inflammation of the sigmoid.

In many cases a test meal is of importance. Of the 100 cases reviewed, a test meal was given in 88. Free hydrochloric acid was present in 61. Five patients had been given acid without benefit. Two others who received it thought that it had been of benefit. Of the 27 who did not have free hydrochloric acid, 6 were benefited by the use of acid. Five of these had the steady type of diarrhoea. Seventeen were not benefited, and the effect of the acid on 4 was not recorded.

Tests of skin sensitization must be considered and should be tried especially in cases of the allergic type of diarrhoea.

Further studies, such as cholecystography, roentgenography of the stomach, and investigations of food, the metabolic rate, etc. are necessary in some cases.

A varied and adequate diet administered as rapidly as is consistent with the patient's tolerance is the goal to be achieved in chronic diarrhoea of unknown origin. In most cases the patient can get along for a day or two without food if sufficient fluids are given. Hypodermoclysis or the intravenous administration of fluid may be resorted to if required. Occasionally it may be necessary to clean out the bowel with a small dose of castor oil or a saline laxative. After the first day, or two simple food of a low-residue type, such as boiled rice with cream or butter, broths, toast, and tea or coffee should be given. Foods such as cooked fruits and vegetables should be added to the diet gradually. Finally raw fruits and vegetables may be given. In cases of sprue, raw liver or its equivalent should be included and gradually decreased as the condition improves.

Routine colonic irrigations are to be condemned.

In certain types of diarrhoea of indeterminate origin treatment with a vaccine may prove of value. Further work must be done on this phase of the problem.

Bottin, J. A Critical Study of Intestinal Obstruction (Essai d'étude critique de l'obstruction intestinale). *Revue de chirurgie*, Paris, 1932, li, 5.

In the literature, death from intestinal obstruction is ascribed most frequently to intoxication, infection, dehydration, and hypochloræmia. Following a review of more than 400 articles on the subject, the author has come to the conclusion that none of these factors can be solely responsible. In his own experiments he has often noted the development of pancreatitis following intraduodenal injections or intestinal obstructions. When the pancreatic duct was tied or transplanted to an unobstructed loop, the symptoms of intestinal obstruction were retarded and the life of the animal was prolonged. Bottin therefore believes that while general toxæmia, infection, dehydration, and hypochloræmia may play a certain rôle, pancreatitis explains a large number of



symptoms and is the chief cause of death following obstruction of the intestines.

GERA DE TAKATS, M D

Haberer H von: Further Experiences with One-Stage Bowel Resection in Fleus (Ueber weitere Erfahrungen mit der einseitigen Darmresektion im Fleus) *Deutsche Zeitschrift für Chirurgie* 193, cccxvii 477

On the basis of further favorable results, the author recommends one-stage resection of the colon with the formation of a temporary fistula even in the presence of fleus. This procedure may be employed also when exteriorization of a tumor is difficult or impossible.

The decompression fistula is made by the Witzel oblique method above the circular intestinal anastomosis. Occasionally even in end-to-side anastomosis of the afferent and efferent portions of the colon, the oral lumen of the afferent loop may be sutured into the wound peripherally to the anastomosis. In cases without fleus, the fistula is intended to protect the peripherally lying suture line from tension due to stasis of intestinal contents. The drainage tube should be large enough to prevent its early occlusion. Irrigation of the tube should not be done before twenty-four hours after the operation. In the presence of fleus, the fistula should permit the most rapid and complete evacuation. The carefully made Witzel fistula reduces the danger of infection of the peritoneum. The author uses a very long drainage tube.

The author does not consider the one-stage resection the method of choice in every case. He states that its feasibility depends upon the general condition of the patient and particularly upon the state of the circulation.

Von Haberer has performed eleven additional one-stage resections, three in the presence of fleus and one in the presence of both fleus and peritonitis. The method has been of such value that he will continue to employ it.

HOLLAND (2)

Mot, E.: The Roentgen Diagnosis of Stenoses of the Small Intestine (*Diagnostique radiologique des rétrécissements de l'intestin grêle*) *Presse médicale Paris* 932 xi, 656.

For obvious reasons only partial subacute or chronic obstructions of the small intestine are subjected to X-ray study. The examination is made without preparation or after the administration of a minimal quantity of barium. The information obtained is both physiological and anatomical.

Nearly always there is a pylorospasm which must be considered in judging the rate of passage through the small intestine. Normally the rate of passage through the small intestine is four hours with a period of stasis in the terminal ileum of two hours.

Early stenosis is revealed clinically by localized pain occurring at fixed times of the day. At this stage the X-ray shows a slowing of the passage of the barium through the intestine, dilatation, and the presence of gas usually in the ileum.

Somewhat later, but even before hernia syndrome becomes evident clinically the barium accumulates above the obstruction and violent peristaltic and antiperistaltic movements can be observed with the fluoroscope. When contracting the bowel is cord-like and the adjacent loops are dilated. The latter are filled with gas and the outlines of their walls are marked by the barium which adheres to the mucosa. In the intervals between digestion a large air bubble remains above the constriction.

With the approach of complete obstruction the musculature becomes atonic, the bowel distends, and peristalsis almost ceases. The abdomen is tympanitic and asymmetrical, and there is a false navel. At this stage the examination is usually made without any preparation. It is best to have the patient standing or seated. Numerous large collections of gas are found in the upper abdomen, often disposed transversely and parallel with one another (organ-pipe appearance). Occasionally there is a fluid level which shifts with the patient's movements. When possible, the topography should be determined by the use of an opaque enema or the administration of a small amount of barium in oil by mouth. Stasis of several hours' duration is a indication for immediate operation.

Except in the earliest stages of intestinal stenosis the diagnosis is obvious and X-ray examination serves only to establish the site of the lesion and to yield some indication of the cause. Tuberculosis produces multiple constrictions, and cancer an obstruction at the ileocecal valve.

ALBERT F. DE GAULLE, M D

Agrioglio, M.: A Contribution to the Study of Chronic Stenoses of the Duodenum from Perivisceritis (Contributo allo studio delle stenosi croniche del duodeno da perivisceritis) *Arch. Ital. di chir.* 932, xxi.

The author reviews the literature on chronic stenoses of the duodenum and reports a number of cases due to various causes. The term "essential perivisceritis" is used to indicate the presence of adhesions about the duodenum in the absence of other lesions in the abdominal cavity. While there is considerable difference of opinion as to the pathogenesis of the adhesions, it is most generally believed that they are congenital and due to abnormal disposition of the peritoneum in the process of development. The strongest evidence in support of this theory is the occasional case of persistent vomiting from birth in which adhesions are the only pathological finding. That such adhesions are compatible with an apparently normal life is evidenced by the fact that they are found in about 10 per cent of cadavers.

The author reports five cases in which adhesions were the only lesion found. In general the symptoms in such cases are a combination of those of mechanical obstruction and those of toxemia from duodenal stasis. The condition occurs in both sexes. There is

usually a long history of dyspepsia. In some cases this dates from infancy. The dyspepsia usually occurs in periodical attacks with intervening periods of complete freedom from disturbances. Later the distress becomes localized to the epigastrium. Vomiting is frequent and is often bilious. Alkalies usually do not relieve the distress. Occasionally a change of position is beneficial. Hæmatemesis and melæna are extremely rare. Muscular rigidity in the epigastrium is common. Gastric analysis usually reveals hyperacidity. X-ray examination is of prime importance although its findings are variable. It may show irregularity in the form and position of the duodenum, dilatation with stasis, antiperistalsis with reflux of barium into the stomach, and vigorous peristalsis. Evidence of ulcer in the form of a niche is absent. Exploration usually reveals a membrane causing angulation of the duodenum or more rarely compressing the duodenum.

As a rule stenosis of the duodenum is secondary to some other lesion in the digestive tract such as duodenal ulcer, gastric ulcer, and cholecystitis. When it is due to peptic ulcer its development can usually be followed with ease as the rhythmical chemical distress changes to general distress plus the toxic symptoms and vomiting obstruction.

The association of chronic stenosis of the duodenum with appendicitis is not common. In several cases bacteria have been found in the lymph spaces of the adhesions about the duodenum.

In mild cases the treatment indicated is medical management with diet, rest, sedatives, physiotherapy, and abdominal support and in more severe cases, an operation to relieve the obstruction, such as simple division of the adhesions, vagotomy, or a short-circuiting operation, depending upon the location of the lesion.

A. LOUIS ROSE, M.D.

Hudson, H. W., Jr., and Koplik, L. H. Meckel's Diverticulum in Children. A Clinical and Pathological Study. *New England J. Med.*, 1932, cccvi, 827.

The authors report on thirty-one cases of Meckel's diverticulum and urge proper evaluation of clinical findings heretofore inadequately emphasized.

Meckel's diverticulum arises from the ileum at a point representing the junction of the superior mesenteric artery and the summit of the loop of midgut, which in postnatal life is located from 8 to 40 in. above the ileocecal valve. While the diverticulum usually presents the structure of the ileum its mucosa and muscularis are occasionally identical with that of the stomach or the large intestine. It varies in size from a tiny elevation to a pouch 33½ in. long. It is present in 2 per cent of bodies. Many pathological conditions have been found associated with it. Among these are acute and chronic diverticulitis, intestinal obstruction, intussusception, acute ulcer with hæmorrhage and perforation, volvulus of the diverticulum with or without volvulus of the ileum, congenital umbilical fistula, prolapse of the diverticulum at the umbilicus, and neoplasm.

In intestinal obstruction due to Meckel's diverticulum it is very important to remember that abdominal distention may be absent as the obstruction is frequently high in the intestinal tract. Therefore in the presence of signs of obstruction without distention operation should not be delayed. The association of hæmorrhage from the intestinal tract with signs and symptoms of appendicitis may lead to a correct diagnosis. The authors emphasize that bleeding from the rectum in acute abdominal conditions is suggestive of pathological changes in Meckel's diverticulum.

Of twenty-six cases presenting symptoms referable to the diverticulum, hæmorrhage from the bowel occurred with or without other signs in seventeen (63 per cent) and was the chief feature in seven. The blood may or may not be mixed with the stool and may be bright red or changed. At laparotomy, the terminal ileum should be examined.

ANTHONY F. SAVA, M.D.

Chiray, M., Lardennois, G., and Lomon, A. The Medico-surgical Treatment of Pelvic Dolichocolon (Traitement médico-chirurgical du dolichocolon pelvien). *Presse méd.*, Par., 1932, xl, 207.

In the period between crises in pelvic dolichocolon medical treatment including regulation of the diet with restriction of the intake of carbohydrates, the use of agar oil, the avoidance of cathartics, and flushing of the colon with a liter of boiled warm water three times a week with retention of the water for ten minutes is often surprisingly efficacious. Care must be taken not to excite an underlying colitis with a too spicy diet or a diet too rich in fat. The value of massage and electrical treatments is doubtful.

During a crisis the physician must decide whether operation is indicated or not. If oil enemata fail to give relief and evidence of ileus supervenes, operation is necessary. Obstruction is usually caused by failure of contraction of the longitudinal muscle fibers of the colon as described by Hurst and Fraser. It is believed by some surgeons that ganglionectomy and ramisection of the lumbar sympathetics re-establish coordination because they reduce the inhibitory action of the sympathetic fibers on the circular fibers of the rectum.

The authors state that the indications for surgical treatment are quite rare. The purpose of surgery is to find the cause of the stasis which leads to the lengthening of the colon. Reduction in the size and re-education of the bowel are left to subsequent medical care.

The primary treatment is dilatation of the rectum. It may be necessary also to sever adhesions, undo twists in the bowels, replace a retroflexed uterus, or remove inflamed and adherent adnexa.

Radical surgical treatment consists in resection of the elongated segment of colon and correction of any underlying condition. In the performance of resection care must be taken to prevent retraction of the bowel ends.

KELLOGG SPEED, M.D.

Bloodgood, J. C.: Cancer of the Colon and of the Rectum. *J. N. Surg.* 1932 xiv 390.

Bloodgood discusses his experience with cancer of the colon and rectum over a period of thirty years. He states that the chief cause of failure to cure cancer of the colon and rectum is delay of intervention. One of the causes of this delay is incomplete pre-operative investigation in which the precancerous or cancerous lesion is overlooked. Apparently the least important factor in the failure to cure the majority of cases of cancer of the colon and rectum is the operative skill of the surgeon.

Bloodgood recommends appendicostomy preliminary to resection of every part of the colon except the right colon when the cecum is removed. He believes that lateral anastomosis, when possible, is safer than end-to-end anastomosis. When the colon itself must be resected the safest method of anastomosis, if it is possible, is similar to that originally described by Billroth. In cases of tumor of the rectum and rectosigmoid, pathological studies and final results demonstrate that it is unnecessary for a cure to remove wide margins of the gut with the malignant tumor. The limited operation should be chosen when possible if it will be associated with less operative risk. For the same reason, operation in stages should be chosen and blood transfusion should be employed freely. It should be remembered also that the rectal tumor can be removed by the sacral route. If a sacral colostomy is unsatisfactory an abdominal colostomy may be done.

Many experienced and well-trained diagnosticians often curtail the pre-operative diagnosis the moment they find something definite indicating surgical intervention. Many experienced surgeons do not give the patient pre-operative preparation before an operation upon the colon proper. If obstruction is present, colostomy is indicated. This may be part of the pre-operative preparation as the obstruction must be relieved. Bloodgood recommends appendicostomy without exploration to determine the position of the tumor unless there are definite symptoms indicating further exploration.

JACOB M. MORA, M.D.

Setta, N., and Bercaroli, I.: A Contribution to the Bacteriological and Anatomical Study of Appendicitis (Contributo allo studio batteriologico ed anatomico dell'appendicite) *Pedici* Rome, 93 xxvix, 157.

The authors made a bacteriological and pathological-anatomical study of 100 excised appendices. From their findings and from clinical observations in 456 cases they conclude that acute appendicitis is usually an acute inflammation superimposed upon a chronic lesion. Mild inflammatory processes in the appendix are not to be interpreted as beginning chronically and becoming acute, but rather as the result of retarded or incomplete healing of a more or less severe acute appendicitis.

The bacteriological flora in the appendices studied was similar to that commonly found in the intestinal

tract. In 22 cases, however, the bacteriological examination was negative. The authors do not attribute any pathological importance to subal parasites in the lumen of the appendix.

Many of the cases of acute appendicitis studied occurred in almost an epidemic form during an influenza epidemic. The authors have noted also that many patients with pharyngotonsillar infection complained of abdominal distress resembling that of acute appendicitis. These observations and the frequent finding of hyperplasia of the appendix have led them to support the hematogenous theory of the pathogenesis of acute appendicitis. They attack also the possibility of the elimination of virus or micro-organisms, especially neurotrophic organisms, by way of the nervous system of the appendix. They doubt the specificity of determined organisms in the etiology of acute appendicitis. PIERA A. ROSE, M.D.

Erdmann, J. F.: Tumors of the Cecum. *AM J SURG* 1932 xvi 3.

In this article Erdmann adds twenty-two surgically treated cases of cecal tumor to a series of forty-eight previously reported by him, making a total of seventy cases treated to date.

Among the tumorous conditions occurring in the cecum are carcinoma, tuberculosis, chronic inflammation, hyperplasia, lymphosarcoma, and polyps. Carcinoma was found in fifty-six of the author's cases, tuberculosis in nine, chronic inflammation in two, lymphosarcoma in one, polypoid in one, and a neoplasm of undetermined nature in one. Erdmann has seen two cases of actinomycosis of the cecum.

In the normal adult the cecum is about 5 1/2 in. long. It is more richly supplied with lymphatics than the rest of the large gut. It is lined by a single layer of columnar epithelium. It lacks villi and valvulae conniventes. The mesenteric vessels and nerves enter the cecum and colon from the lower or left side. The blood supply of the cecum is derived from the ileocolic branch of the superior mesenteric artery. The ascending colon is supplied by the right colic artery and the transverse colon by the median colic artery. The lymphatic drainage follows the course of the ileocolic blood vessels. The lymph systems may drain into five different groups of glands about the cecum or directly into the glands about the ileocolic artery above.

Lymphosarcoma of the cecum is extremely rare. The symptoms it produces are similar to those of other cecal tumors occurring in early adult life. The tumor grows very rapidly and is not tender. It begins in the submucosa and is made up of small or large round cells. Very soon the entire gut wall is infiltrated. With sarcomatous invasion the gut wall has a tendency to become dilated rather than constricted. Polypoid tumor excrescences are not unusual. The course is rapidly fatal. Mistakes occur early.

Tuberculosis may occur in the cecal region primarily or secondarily. The pathological differences

are quite unique and distinct. The gastro-intestinal tract is found involved in from 70 to 90 per cent of cases of pulmonary tuberculosis. Of this number, the ileocecal region is involved in about 85 per cent.

The best explanation of the frequency of tuberculosis in the ileocecal region is offered by the anatomy of that region. Next to the rectum, the cæcum has the largest supply of lymphoid tissue in the large intestine.

In children, ileocecal tuberculosis is often caused by infected milk, and in adults by the stasis of infected food or swallowed sputum at the cæcal head.

There is nothing in the syndrome which is characteristic of tuberculosis unless it is the insidious onset and chronicity of the condition and the interval of freedom from symptoms. Pain is an early symptom. At first it consists of distress, but later is cramp-like and irregular. It is associated with tenderness and rigidity in the right lower quadrant of the abdomen. Obstinate constipation and diarrhoea are prominent symptoms. Vomiting, belching, and epigastric discomfort occur early. Roentgenoscopy and roentgenography after the administration of a barium meal are of great aid in the diagnosis, revealing hypermotility, spasticity, and a filling defect in the ileocecal region.

Pathologically there are two distinct types of ileocecal tuberculosis, the ulcerative and the hyperplastic. The ulcerative or enteroperitoneal type is often a secondary manifestation of a primary focus elsewhere. The tubercles occur first in the mucosa and spread and coalesce to form shallow ulcers. As the lymphatics and vessels run circularly the ulcers may encircle the gut. Therefore when healing occurs a stenosis may result. Similar tubercles may be found studding the serosa. The condition is surgical only when obstruction is impending.

Hyperplastic tuberculosis of the cæcum is considered to be primary in that part of the gut. Surgical excision frequently effects a cure. Gradual thickening of the wall of the cæcum and the terminal ileum frequently results in obstruction of the lumen of the intestine. Obstruction of varying degree is present in all cases.

Of the nine cases of cæcal tuberculosis reviewed by the author, five were of the hyperplastic type. In two there were papillary projections of the mucous membrane. One case was of the ulcerative, constricting type with the primary focus in the middle lobe of the right lung. In all of the cases a diagnosis of appendicitis had been made at some time. In two cases appendectomy had been performed, and in one case it had resulted in a fæcal fistula. In three cases a Friedreich resection with side-to-side anastomosis of the ileum to the transverse colon was done in one stage. The results were uniformly good. Of seven patients, only one died a child two and a half years old who had been subjected to appendectomy. When followed up later, the other patients reported freedom from symptoms and marked general improvement.

Carcinoma of the intestinal tract is most frequent in the foregut and the hindgut. As the more fixed portions of the intestinal tract offer greater resistance to faecal movements, they are subjected to more constant irritation. Tumors of the cæcum grow slowly and are only moderately malignant. They metastasize less frequently than tumors of a similar nature in other organs. Carcinoma begins in a circumscribed area of mucosa with enlargement of the adjacent lymph glands and permeation of the basement membrane. Ewing classifies carcinomata of the bowel as follows: adenoma destruens, stenosing fibrocarcinoma, colloid gelatinous adenocarcinoma, multiple carcinomata from polyposis, papillary carcinoma from single polyps, and melanoma. The signet-ring cells tend to be more malignant than the glandular type with columnar growth.

The symptoms of carcinoma at the cæcal head are due largely to complications and rarely bring the patient to the physician early. The usual complaints are pain, constipation alternating with diarrhoea, nausea, vomiting, and distention. Among the common objective signs are weight loss, the presence of a tumor mass, tenderness, melæna, visible peristalsis, and secondary anaemia.

The author prefers the Friedreich operation for tumors of the right side of the colon. This technique was used in forty-six of the reported cases. It consists of the removal of from 10 to 12 in. of the ileum, the entire cæcum and ascending colon, and from one-third to one-half of the transverse colon, followed by anastomosis of the ileum to the transverse colon. As a rule end-to-end anastomosis is done, but when the colon is very fat side-to-side anastomosis is preferable.

JOHN W. NUTZ, M.D.

Charrier, A., and Dubourg, G. Twenty-Six Cases of Perineal Amputation of the Rectum. Some End-Results (A propos de 26 cas d'amputation périméale du rectum. Quelques résultats éloignés). *Bordeaux chir.*, 1932, No. 2, 101.

In the period from 1924 to 1927 the authors performed twenty-six perineal amputations of the rectum. The twenty-six cases are reported briefly. Eighteen of the patients were men, the sex ratio therefore agreeing with that reported by Hartmann, Kocher, and Kuttner who found cancer of the rectum twice as frequent in males as in females. Except in the case of a woman twenty-two years old, the condition developed at the usual age for cancer.

There seemed to be no relation of the condition to hæmorrhoids, or polyps. Sixteen of the cancers were in the ampulla, eight in the anus, and two in the rectosigmoid. In one case there were two neoplastic ulcerations 6 cm. apart. Cases of this type are very rare.

In three cases of cancer of the anus the lesion extended to the skin of the neighboring portions and infected the rectal fossæ. In two cases of ampullar cancer it spread to the vagina and in one case it extended to the sacrum. In one case, involvement of

Bloodgood J C.: Cancer of the Colon and of the Rectum. *Am Surg* 93 xiv 590.

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Tuberculosis may occur in the cecal region primarily or secondarily. The pathological differences

intestine is insufflated with air, care being taken not to introduce more than 200 c cm. The roentgenograms are then made at once.

For examination of the stomach the patient is prepared by fasting and the administration of laxatives. A mixture of 20 c cm. of umbrathor with 20 c cm. of water is injected through a tube, the patient being turned in various positions and the stomach massaged. A quantity of air up to about 40 c cm. is then injected slowly under fluoroscopic control.

For visualization of the bladder the bowels are cleared by an enema, the bladder is emptied, and a warm solution of two parts of water and one part of umbrathor is injected into the bladder, left in place a few moments, and evacuated by the sound. Then, through the same sound, the bladder is filled with from 70 to 120 c cm. of air. This procedure must be carried out rapidly as the thorium is precipitated by the urine and after precipitation good images cannot be obtained. The roentgenograms should be made stereoscopically.

For ascending pyelography, Thorotrast 1019-A is employed. After proper preparation of the patient on the roentgenographic table the bladder is filled with from 100 to 200 c cm. of distilled water, ureteral sounds are passed, and, after being emptied by aspiration, the renal pelvis is slowly filled with the thorotrast. Six cubic centimeters of the thorotrast are introduced. The first film is then exposed. When this has been done, all of the liquid possible is extracted by aspiration, about 10 c cm. of air are introduced slowly, and a second roentgenogram is made to show the renal pelvis in relief. After the roentgen examination the bladder is emptied.

For visualization of the liver and spleen Heuser employs Thorotrast 1073-A. In experiments on rabbits he gives 1 c cm. per kilogram of body weight with 2 c cm. of glucose solution through the ear vein. The roentgenograms are made after twenty-four hours. If necessary, others are made one or two days later. In clinical cases the method should be used only in conditions such as cancer, hydatid cyst of the liver, and similar grave diseases. In clinical cases the author employs the technique described by the makers of the drug. In cases of cancer of the liver the procedure seems to lessen the pain. The first day, 25 c cm. of the drug mixed with two parts of glucose solution are injected slowly with the patient fasting. This is repeated every two days until 75 c cm. of the thorotrast have been introduced.

JAMES T. CASE, M.D.

Johnson, W. R. The Differential Diagnosis of Cases of Jaundice Without Pain. *Med Clin North Am*, 1932, 25, 1513.

Jaundice without pain offers many difficult problems in diagnosis. Unrelieved obstructive jaundice may produce serious and even fatal injury to the parenchyma of the liver.

The absence of pain does not rule out stones in the common duct, carcinoma, or other conditions

ordinarily productive of pain with jaundice. Even cholecystitis with stones and jaundice may occur without pain. Therefore it is important to differentiate an intrabepatic, hæmolytic, or obstructive jaundice when painless jaundice is present. The most important aid is the history. This will help to differentiate major factors such as drugs administered for rheumatism, syphilis, and amœbiasis, and phenylhydrazine for polycythæmia. The character of the onset of the jaundice in the aged or young and a history of biliary colic, hæmatemesis, or a familial incidence of jaundice are suggestive. The physical examination may show collateral circulation, umbilical or supraclavicular lymph nodes, rectal implants, enlargement of the gall bladder or spleen, raindrop pigmentation, or definite anæmia.

Laboratory tests are important. The height and fluctuation of the bilirubin content of the serum is often helpful. A sudden rise with a sudden fall indicates intermittent obstruction of the common duct. A sudden rise which is sustained or followed by a gradual fall suggests catarrhal jaundice. In the cases of elderly patients a gradually rising curve which is sustained may indicate malignancy. A low and slightly fluctuating level is often observed in biliary cirrhosis. The van den Bergh reaction alone does not definitely distinguish jaundice due to an obstruction of the extrahepatic ducts from that due to disease of the hepatic parenchyma.

Duodenal aspiration is of major importance. Blood-tinged mucus most frequently indicates carcinoma of the gall bladder, bile ducts, or pancreas. Continued absence of bile is rarely encountered except in complete benign stricture or obstruction due to malignancy. Cholesterol crystals or bilirubin pigment should suggest the presence of an obstructing calculus.

A definite increase in the blood cholesterol suggests obstructive jaundice, whereas a marked decrease in the cholesterol ester level indicates intrahepatic jaundice. In time, the galactose-tolerance tests may prove a most valuable adjunct.

In the differential diagnosis of jaundice without pain a careful evaluation of the history and the findings of a general examination with an estimation of the level of the serum bilirubin, the duodenal content, the galactose-tolerance tests, and the level of blood cholesterol will usually lead to a correct diagnosis.

STANLEY H. MENTZER, M.D.

Patel and Mallet-Guy. Intolerant Gall Bladder and Chronic Pancreatitis (Vésicule biliaire intolérante et pancréatite chronique). *Lyon chir*, 1932, 22, 199.

In the case reported, gall-bladder drainage was done in 1924. No stones were found. On closure of the fistula the biliary colic promptly recurred, and in 1929 cholecystostomy became necessary again. An X-ray study of the ducts was then made by injecting the fistula with lipiodol. The common duct was found tortuous and rigid but free from obstruction. Because of the gall-bladder intolerant chole-

the prostate and a seminal vesicle was suspected. Most of the cancers of the rectal mucosa were typical epitheliomata. A few of the tumors were atypical epitheliomata, true carcinomata but none was a colloid epithelioma.

In amputating the rectum the authors use the classical technique. The formation of a permanent anus is necessary. The authors prefer to make a left iliac anus. The colostomy is done from eight to fifteen days before the perineal stage of the operation.

Quite often the diagnosis remains uncertain in spite of the efforts of the clinician and in spite of exploratory laparotomy. In such cases colostomy will remove all doubt. After derivation of the feces the rectum is liberated from its inflammatory adhesions, the tumor which previously was fixed, becomes mobile and a cancer which has been considered inoperable may be found operable.

The mortality in the cases reviewed was 21.40 per cent. Tixer operated upon thirty two cases with no mortality whereas Lambert operated upon twenty nine cases with a mortality of 30 per cent. The three deaths in the authors' cases were due to pelvic cellulitis. This can be combated by colostomy preceding the amputation.

The end-results could be determined in only fifteen of the authors' cases. Five of the patients died before the third year. Statistics from the literature show that in 45 per cent of cases perineal amputation of the rectum assures a survival of at least three years. Five of the authors' patients survived the operation for three years, three for four years, and one for seven years. Two developed a recurrence in the first year and three developed a recurrence in the fifth year.

When well executed, perineal amputation of the rectum permits the surgeon to go far above the limits of the tumor and remove an appreciable amount of the mesorectum with its glands. Recurrences suggest that the operation should extend well beyond the diseased area, especially toward the prostate, in front of the rectum. PAGE

Abel, A. L.: The Pecten: The Pecten Band, Pectinosis and Pectenotomy. *Lancet* 93, 714.

"Pecten" is the name given by Storr to a proapically the middle third of the anal canal. The pecten begins at the level of the median borders of the levator ani muscles. In a state of repose the anal canal is a slit like passageway kept closed by compression of its upper end by the levator ani muscles and below these by compression of the internal and external sphincter muscles. During defecation it becomes oval and shorter. Its normal length is 1 3/4 in. A white line above the junction of the skin and the mucous membrane. This white line corresponds exactly to the lineal interval between the external and internal sphincter muscle. It is a very important landmark. Below the level of Hilton's white line the anal canal is lined with squamous

epithelium which is indistinguishable from ordinary skin. The white line is often referred to as the mucocutaneous junction. The pecten is an area 1/2 in. wide immediately above the white line. From the upper edge of the pecten the columns of Morgagni arise like the teeth of a comb. Pennington estimates that 85 per cent of all proctological diseases begin in the pecten.

The old-fashioned procedure of stretching the sphincters produces a rupture of the fibers of the pecten band in many places, usually with multiple areas of extravasation of blood among the fibers and the consequent formation of fibrous tissue and thickening of the pecten band. If little hemorrhage occurs, complete relaxation of the sphincters results. In the author's opinion, a clean incision through the pecten band, pectenotomy, is preferable to stretching of the sphincters. This operation is performed with the patient lying in the right lateral position. The index finger of the left hand is inserted into the anal canal without a lubricant and the right posterior quadrant of the canal is everted. A hole to the right of the midline an incision is made parallel with the long axis of the bowel. As soon as the mucous membrane and skin have been divided, the white fibers of the pecten band come into view at the upper end of the incision and the reddish-brown fibers of the external sphincter appear at the lower end of the incision. The incision is carried deeper until the complete thickness of the pecten band is divided. As soon as it is completed the anus is so completely relaxed that two or three fingers can be passed into it, whereas before the pectenotomy the sphincter was very tightly spastic. JOHN W. HYMAN, M.D.

#### LIVER, GALL BLADDER, PANCREAS, AND SPLEEN

Hansen, C.: Hepatolienography with Thorotrast (1874-A). *Radiol. Roentgenography of the Wall of the Stomach, the Intestine, and the Bladder with "Umbrethor" and Imposition of the Manual Pelvis with Thorotrast* 1874-A (Hepatolienografía con el Thorotrast 073-A, radiografía de relieve de la pared del estómago, intestino y vejiga con la solución del umbrethor y la inyección de la pelvis manual con el Thorotrast 019-A) *Seminario* 93, 2da, 54.

Colloidal preparations of thorium chloride have been used for various types of roentgenography. Umbrethor is of value to show the mucosa of the gastro-lateral tract in relief.

For visualization of the colon the patient is prepared with a purgative and a liquid diet. A large colonic sound introduced as deeply as possible, and then, with syringe and strong pressure 200 c.c. of umbrethor and an equal quantity of water are injected. Following this injection the tube is withdrawn slowly so as to leave a small quantity of the solution along the bowel, and at the same time the abdomen is massaged to impregnate the mucosa. After a considerable wait, as much of the liquid as possible is withdrawn and ten minutes later the

Two operative procedures were used. In one, the pancreatic duct was ligated and all except the head of the organ was resected. In the other the duct was ligated and all of the vascular pedicles with the exception of the pancreatic branch of the duodeno-pancreatic artery were sectioned. After both procedures the remaining atrophic pancreatic tissue was removed from seven to ten months later. Each experiment was completed by necropsy with microscopic study to control particularly the pancreatectomy. Sugar tolerance was determined by plotting a blood sugar curve following the administration of glucose by mouth or intravenously. The second stage of the pancreatectomy was usually delayed until after the sugar tolerance had become normal.

When the experiment was carried out under the best conditions the blood-sugar curve became normal after several months and remained normal after the second operation in which the remaining pancreatic tissue was removed. Occasionally the animal showed a reduced tolerance, but even then did not become diabetic on a normal diet.

After the first operation the sugar tolerance sometimes appeared normal when the glucose was administered by mouth, but after the second operation the animal died of typical diabetes. In such cases glucose given intravenously produced a high blood-sugar curve.

It was found that simple ligation of the duct does not stimulate the vicarious function of the reticulo-endothelial system because the internal secretion of the pancreas is not impaired.

In the case of a dog operated upon according to the second technique described, determinations made a year and a half later showed a lowered sugar

tolerance but no glycosuria on an ordinary diet. At laparotomy the spleen was found to be twice the normal size. Splenectomy was performed. The atrophied pancreas was left *in situ*. A fatal diabetes immediately resulted. In the cases of some dogs a fair sugar tolerance was maintained. This is explained by the fact that the spleen of the dog, as compared with that of other animals, contains only a relatively small portion of the total reticulo-endothelial tissue. ALBERT F. DE GROOT, M.D.

Morwa, R. Traumatic Rupture of the Spleen (Rupture traumatique de la rate) *Revue de chirurgie*, Paris, 1932, li, 97.

On the basis of seventy-seven cases of traumatic rupture of the spleen reported in the literature and one case of his own the author calls attention to the importance of watching for delayed hemorrhage. Delayed hemorrhage may occur from twenty-four hours to eighteen months after the injury. During the latent period a slight tenderness of the left upper quadrant and perhaps a slight muscular rigidity and an elevation of the temperature suggest a splenic hematoma or a subcapsular hemorrhage, both of which may give rise to a massive secondary hemorrhage. However, in more than half of the reported cases no signs or symptoms were present.

In the treatment of splenic rupture splenectomy is the method of choice. If the operation can be performed in the latent period, the prognosis is much better than if the patient is seen at the time of secondary hemorrhage.

Splenectomy causes only a temporary change in the normal blood picture. The loss of the spleen is well tolerated in traumatic injuries.

GEZA DE TAKATS, M.D.



cystectomy seemed contra indicated and cholecystogastrostomy was done. The immediate result was good, but after four months the pain recurred.

Simultaneous tubage of the stomach and duodenum showed the anastomosis to be permeable. Only a small portion of the bile passed by way of the common duct. The pain coincided with the rush of chyme through the duodenum.

Exploratory operation to discover the cause of the obstruction of the common duct revealed enlargement and induration of the head of the pancreas. The patient continued to have attacks of colic with chilly sensations and slight icterus.

This case is believed by the authors to show the successive stages of chronic pancreatitis. First to develop is pain, which simulates that of gall-stone colic. This is due to interference with peristalsis in the common duct. Later there is occlusion of the duct with a phase of chronic icterus. Such a course of events was described by Bernard in 1906.

These cases offer an argument for cholecystostomy in the presence of a gall-bladder syndrome without stones. Cholecystogastrostomy has the advantage of avoiding an external fistula. However it is not an ideal operation as the essential lesion is in the pancreas. In fact, it does not protect against subsequent acute pancreatitis (Brocq and Mignot).

In the discussion of this report, VILLARD said that there are four causes of persistent fistula in the absence of stones: (1) the secretion of an abnormally thick mucus by the gall bladder (2) abnormality of Heister's valves, (3) too tight suturing of the gall bladder to the skin and (4) obstruction of the common duct. Because all but obstruction of the common duct are remedied by cholecystectomy Villard favors this operation as a routine procedure. He stated that in the determination of the cause of obstruction of the common duct lipiodol is not of great value when stones are absent as it often passes an inflammatory stricture without difficulty and even a slight degree of obstruction will cause the persistence of a fistula.

SANTY said that, in the absence of stones, he prefers cholecystostomy because it permits an accurate study of the biliary tract and preserves the gall bladder.

ALAN F. DE GOSSET, M.D.

Schrager, V. L., Ivy, A. C., and Morgan, J. E.: A Method for the Plastic Reconstruction of the Common Bile Duct. An Experimental Study. *Surg. Gynec. & Obst.*, 93, 117 & 2.

The methods commonly used today for reconstruction of the common bile duct have a high mortality and often prove unsatisfactory. The authors offer a new one-stage operation which has been found experimentally to be quite successful.

In dogs, the anterior wall of the stomach over the pylorus was incised between clamps from the lesser to the greater curvature and down to the mesocolon, somewhat in the manner of the Ramstedt operation. The edges of the divided musculature were spread by blunt dissection until a rectangular flap

1 in. wide could be cut from the mesocolon. The flap with its base intact toward the lesser curvature was then made into a tube 1.5 in. long by stitching the free edges to each other over a catheter. The tube remained viable as it contained nerves and blood vessels coming from the lesser curvature where the pedicle was attached. The defects in the stomach were closed in the manner of the usual pyloroplasty but one stitch was placed above and one below the base of the tube in such a way as to form a muscular cuff around the basal circumference of the tube. This stitch, when properly placed, invaginated the mesocolon of the tube which acted as a valve.

A tube formed in this manner meets the requirements of plastic reconstruction of a biliary duct as it is lined with epithelium and epithelium is present at the points of anastomosis, it contains no absorbable suture material in its lumen, it is free from tension, it empties into a viscous biologically receptive bile. It contains a valvulosphincteric mechanism and it conforms to the normal obliquity of the gastro-intestinal viscera.

In three dogs the tube thus made was connected to the gall bladder by the classical gastro-entostomy technique and in four dogs the anastomosis was made by cuffing the gall bladder onto the tube. In two dogs the catheter was left in place. This method prevented the usual postoperative edema and subsequent jaundice of three or four days duration. The tube was invariably passed with the feces within ten days.

In two dogs the common duct was anastomosed to the artificial tube by an end-to-side anastomosis similar to that used by Coffey to implant the ureter in the large bowel.

Eight of the dogs were living from one to three months after the operation in excellent condition and free from jaundice. Six of these had a gall-bladder anastomosis and two a common-duct anastomosis. Three dogs died as the result of the operation, one after two weeks from distemper and a leak at the gall-bladder anastomosis, one after two days from necrosis of the distal end of the gastric tube, and one after three days from a leak at the gall-bladder anastomosis.

In four dogs, fluoroscopic examination showed that the gastric tube thus made prevented regurgitation. Further studies are necessary to determine if ascending infection of the biliary passages can be prevented.

STANLEY H. MANTON, M.D.

Escudero, P.: Progressive and Complete Exclusion of the Pancreas in the Dog Does Not Cause Diabetes. The Reticulo-Endothelial Tissue Is the Vicarious Tissue of the Pancreas (La suppression progressive et totale du pancréas ne produit pas le diabète. Le tissu réticulo-endothélial est le tissu vicariant du pancréas). *Rev. Sud. Am. de med. et de chir.* 932, 4, 1.

Escudero reports experiments carried out on dogs to determine the effects of gradual elimination of the function of the pancreas.

and solution, antiseptic powder applied with an insufflator, and an antiseptic sedative and ointment are of value in the treatment of gonorrhœa, but the remedy for routine use is a 5 per cent suspension of acriflavine in glycerin and castor oil. He applies this with a hollow sound or a probe as a solid object may force the infection higher.

RORKE called attention again to the possibility of making an erroneous diagnosis of gonorrhœa in cases of vaginitis, and stated that the colon bacillus is frequently responsible for the condition. For provocation of the infection she prefers provocative injections of vaccine to giving the patient a cocktail or champagne and taking cultures the following morning.

KEYES cited a case in which diathermy used on account of the genito-urinary infection cleared up an arthritis due to gonorrhœa.

LOGAN stated that at King's College Hospital London, she made it a rule to keep patients under observation for a period of two years after the cessation of the treatment before discharging them as cured.

CHESTER C. DOHERTY, M.D.

**Billiard and Douay. An Investigation of the Ovarian Hormones in "Deciduiform Metritis"** (Recherche des hormones ovariennes dans la métrite déciduiforme) *Bull. Soc. d'obst. et de gynec. de Par.*, 1932, xxi, 85.

The condition described by Moukaye in 1921 as "métrite déciduiforme" occurs most frequently at the extremes of menstrual life. It is characterized by profuse and prolonged menstruation which resists all treatment. Pelvic examination reveals no important lesion. Uterography with lipiodol shows the uterine cavity to be regular but the edges of its shadow are tortuous. Curettage reveals thickening of the endometrium. Histological examination shows the presence of decidua-like cells in the upper layer of the mucosa and a tortuous arrangement of pseudoglands. The lumina of some of the glands are filled with mucous secretion.

The determining cause of the uterine bleeding is the excessive development and abnormal persistence of one or more corpora lutea. The persistent corpora lutea produce hypertrophy and changes in the endometrium which are similar to those of pregnancy. At the time of menstruation the endometrium is not cast off completely. A great deal of it, thickened and very vascular, remains in the uterus and produces persistent bleeding which is sometimes very severe.

Curettage does not cure this form of menorrhagia. Under the influence of the persistent corpus luteum the bleeding increases until the ovary resumes its function and the corpus luteum undergoes its habitual regressive changes.

The treatment may consist of surgical removal of the ovary with the diseased corpus luteum or of irradiation to produce atrophy of the corpus luteum and stop ovarian function temporarily. In the cases of young women the authors usually prefer radium

therapy in small doses repeated if necessary, to produce temporary amenorrhœa. In the cases of women near the menopause a castration dose should be employed. In a case reported by the authors the blood serum injected into three castrated female rats was found to contain a considerable amount of lutein hormone (progesterin) and only a very small amount of the female sex hormone (œstrin).

In discussing this report, BÉCLÈRE briefly reviewed Zondek's book on the hormones of the ovary and the anterior lobe of the hypophysis which was published in Germany in 1921.

ISAAC ANDREUSSIER, M.D.

## ADNEXAL AND PERIUTERINE CONDITIONS

**Madruzzo, G. Reticulated Tissue in the Normal and Pathological Fallopian Tube** (Il tessuto reticolato nella tuba normale e patologica) *Riv. ital. di gynec.*, 1932, xxi, 575.

The author made a histological study of sections of fallopian tubes which had been removed surgically in the Section of Gynecology and Obstetrics of the Royal University of Perugia. The material included normal tubes, tubes with acute and chronic inflammation, tuberculous tubes and tubes removed during pregnancy and after the menopause. The tissues were stained with the silver method of Rio Hortega as modified by Volterra to bring out the reticular tissue, the connective tissue stains of Mallory, von Gieson, and Callego, the elastic fiber stain of Weigert, and ordinary hematoxylin-eosin.

It was found that the various morbid processes studied produce definite changes and these in turn cause changes in the elastic and collagenous tissues such that the resulting mechanical changes in the wall of the tube may lead to tubal rupture.

In conclusion Madruzzo compares his findings with those reported in the literature.

EUGENE T. LEDDI, M.D.

**Brandberg, R. A Case of a Papillary Pseudomucinous Ovarian Cyst with Metastasis to the Spleen** *Acta obst. et gynec. Scand.*, 1932, xxi, 22.

Between the extirpation of the two ovarian cysts and extirpation of the splenic tumor in the case reported, twenty-five and twenty-six years respectively elapsed. The author believes that the metastasis to the spleen took place by implantation in the peritoneum of the splenic hilus and penetration of the organ along the vessels of the hilus. The patient is still free from recurrence six years after the splenectomy.

Brandberg was able to find only one other case of this kind reported in the literature.

## EXTERNAL GENITALIA

**Plassat, E. Esthiomene of the Vulva** (Esthiomène de la vulve) *Gynecologie*, 1932, xxxi, 129.

The author reports a typical case of esthiomene of the vulva hoping from its clinical aspect to gain

# GYNECOLOGY

## UTERUS

Harrison, L. W., Abraham, J. J., Davies, A., Heamant, L., Lees, D., and MacLeod, D. H.: Discussion on Gonorrhoea and Other Cervical Discharges. *Proc. Roy. Soc. Med. Lond.*, 1938, xiv 819.

HARRISON urged greater accuracy in the determination of the cause of vaginal discharges and called attention to the diagnostic value of microscopic, cultural, and complement fixation tests. He divided vaginal discharges into 3 groups: (1) gonorrhoeal discharges, (2) discharges due to bacteria other than the gonococcus and (3) chemical discharges. He stated that each group requires a different kind of treatment. Of 304 cases of vaginal discharge, 143 were due to the gonococcus and 151 to other bacteria. For the non-specific type of infection, Harrison prefers the use of a 10 per cent solution of mercuriochrome-250. He emphasized that care in the application of an antiseptic is of as much importance as the character of the antiseptic. With regard to the treatment of gonorrhoeal infections he called attention to a specially prepared vaccine employed by Clements at St. Thomas' Hospital, London. He believes that the use of this vaccine with frequent checks of the titer of the complement-fixation reaction is the most rational method for the treatment of discharges of gonorrhoeal origin.

ABRAHAM reported that of 1,000 cases of vaginal discharge, 153 were non venereal. Gonorrhoea was suggested clinically in 848 but was proved by laboratory methods in only 411. Three hundred and five of the 1,000 women were pregnant. Gonorrhoea was suggested clinically in the cases of 59 of the latter but was proved by laboratory methods in only 91. Abraham concluded that it is more difficult to isolate the gonococcus from a pregnant woman than from a non-pregnant woman. His criteria of cure are apparent absence of the disease from all parts of the genital tract, negative smears and cultures taken two days before and two days after menstruation, a negative provocative injection of gonococcal protease and negative cultural examinations of the urine.

DAVIES believes that in many cases the uterine cavity is infected and should be treated. His experience with diathermy has been very unsatisfactory. He regards glycerin as the best remedy.

HEAMANT emphasized the importance of psychological encouragement of the patient.

LEES divided vaginal discharges into 3 types: (1) definitely gonorrhoeal discharges, (2) clinically, but not bacteriologically gonorrhoeal discharges, and (3) discharges which are definitely not gonorrhoeal. He stated that the chief aims of treatment should be

to increase resistance by the use of vaccines and other methods, promote drainage, and destroy the infecting organism. His criteria of cure are practically the same as those mentioned by Abraham.

MACLEOD reported that in the routine treatment of subacute and chronic cases at the Middlesex Hospital, London, the urethral and cervical canals are irrigated daily for a month with a solution of bicarbonate of soda to remove the mucus and then with a 10 per cent solution of dichloramine-T. After the irrigation the vagina is dried and lightly packed with gauze soaked in a 5 per cent solution of mercuriochrome in glycerin. In acute cases the patient is put to bed and given frequent hot baths until the symptoms subside. On subsidence of the symptoms she receives the routine treatment. In the case of pregnant women urethral irrigations are given as described, but the cervix is painted twice daily with Bonney's blue, a 0.5 per cent solution of both crystal violet and brilliant green in alcohol or a 10 per cent solution of protargol, and the vagina is not packed. Gonococci are more likely to be found at the end of the menstrual period than at any other period; therefore this is the opportune time to take smears. MacLeod does not regard vaccine treatment of much value. He considers the patient cured when three successive clinical and microscopic examinations made at monthly intervals are negative.

MOORE stated that it is futile to attempt to compare the results obtained by various methods of treatment. From his experience he drew the following conclusions:

1. With the use of local applications, about 50 per cent of patients are clinically cured and cease to yield gonococci after five or six months of intensive treatment.

2. In the cases of the remaining 50 per cent it is a waste of time to continue treatment.

3. Cases that do not quickly clear up are best treated by diathermy.

4. Diathermy has no specific action in killing the gonococcus, but promotes drainage and stimulates local resistance to the infection.

5. Many chronic cases apparently clear up after a course of diathermy treatment.

In trichomonas vaginitis, which causes a type of vaginitis frequently mistaken for gonorrhoea, Moore's treatment consists of daily painting of the vagina with a 1 per cent solution of picric acid in 1 part of alcohol and 3 parts of water and daily douching with a 1 per cent lactic acid solution.

WATSON stated that he relies on bacteriological study for the diagnosis of gonorrhoea. He described his technique for obtaining smears. He stated that dichloramine-T, cocoylptus and castor oil, formalin in glycerin, kodoform in kudu oil, quinine in powder

Petit-Dutaillis, P. A Study of the Beginning, Course, and Treatment of Primary Epitheliomata of the Vulva Based on Seventeen Observed and Treated Cases (*Considérations sur le début, l'évolution, et le traitement des épithéliomes primitifs de la vulve d'après dix-sept cas observés et traités*) *Gynécologie*, 1932, xxxi, 65

Cancers of the vulva are rare. Most of them are epitheliomata.

The author has collected seventeen cases of primary epithelioma of the vulva. Most of the patients were past the sixth decade of life and a few were in the eighth decade. The cases are divided into two series.

The first series consisted of nine cases of epithelioma limited to the vulva and without glandular involvement. Five of these cases were treated by total vulvectomy, two by vulvectomy and radium irradiation, and two by radium irradiation alone.

The second series of cases included eight in which the epithelioma involved the inguinal lymph glands and neighboring organs. In the cases of this group in which the lesion was less extensive the treatment consisted of radium irradiation or surgery. In the nearly hopeless cases, irradiation was employed after removal of the cancerous masses with the cautery. This treatment was given chiefly for palliation and results were very mediocre.

Epitheliomata of the vulva are as curable as epitheliomata elsewhere if they are treated properly in an early stage. Benign lesions of the vulva, such as papillomata, leucoplakia, kraurosis, and Bowen's disease, should be treated as they predispose to the future development of malignancy.

Besides surgery and radiotherapy the author has used magnesium chloride and splenic extract in the treatment of epitheliomata of the vulva as suggested by Delbet. As a form of protein therapy he mentions the daily administration by mouth of a 10 to 21 per cent globulin extract prepared from the epitheliomatous growth. ISAAC ANDRUSSIER, M.D.

Hinselmann, H. Partitioning of the Vaginal Mucous Membrane (Felderung der Scheiden-schleimhaut) *Ztschr. f. Geburtsh. u. Gynaek.*, 1931, ci, 166

As the change in the mucous membrane which the author designates as "Felderung" (partitioning or marking off into fields) cannot be recognized on colposcopic examination without magnifying 10 to 15 times, it will be new to many gynecologists. The author reported this change in fetal mucous membrane three or four years ago.

A case of extensive partitioning of the vaginal mucous membrane calls for further discussion. The macroscopic or colposcopic appearance is shown by an illustration in color. The author's supposition that ectopic cervical glands are present in the changed area of vaginal mucous membrane is proved correct by photomicrographs.

After thorough investigation, Hinselmann concluded that the origin of the "fields" must be sought

in epithelial blocks at the site of and in relationship to, deep and voluminous or superficial and atrophied glands. As the relationship between partitioning and leucoplakia is so intimate, it appears from the author's researches that partitioning may constitute the basis of leucoplakia. HANS O. NEUMANN (G)

## MISCELLANEOUS

Bonney, V. On Sterility. *Lancet*, 1932, ccxxii, 971

The requisites for conception are a fertilizable egg-cell, a potent sperm, an uninterrupted trackway along which they may meet, and a surface suitable for implantation of the oöspERM.

It is generally agreed that the human egg-cell escapes from the follicle about midway between two menstrual periods, but the length of time it takes to descend into the uterus is not known definitely. In certain women dehiscence does not occur at all or occurs only very seldom.

Sterility may be relative. The results of stock breeding show that certain females of a species are infertile to some of the males though fertile to others. This is almost certainly true also of human females, though it is difficult to prove in individual cases.

It is generally agreed that fusion between the egg-cell and sperm occurs in the tube, but how long the human sperm takes to ascend to the tube and how long it can maintain itself there is not known.

Sperm impotence may be absolute because of deficient vitality of the male element or, like egg-cell infertility, it may be relative. The sperm, though healthy at the beginning of its journey, may have its potency destroyed or weakened by the toxic effect of an abnormal discharge from the female passages.

The female genital tract may be divided into (1) the ovarian segment, (2) the peritoneal segment, (3) the uterine segment, (4) the cervical segment, and (5) the vaginal segment. If any one of these segments is occluded pregnancy cannot occur.

**Ovarian segment.** That the follicle after dehiscence forms the upper end of the female genital canal is proved by the occurrence of ovarian pregnancy.

**Peritoneal segment.** It appears certain that the ovular wastage along the peritoneal segment of the trackway is normally large. Under abnormal conditions, such as adhesions of the omentum, appendices epiploicæ, or intestine, every egg-cell escaping from the ovary must perish in the abdominal cavity.

**Tubal segment.** Our knowledge of tubal occlusion as a cause of sterility has been greatly increased by Rubin's tubal insufflation test. This test should never be carried out when the vagina or cervix presents any suggestion of infection. It is advisable to prohibit marital relations for some time before the test is made.

In recent years the state of the tubes has been determined by injecting lipiodol into the uterine cavity. If the uterine ostia are patent, the lipiodol passes into the tubes, and if the abdominal ostia are also patent it enters the abdominal cavity. After

some idea as to the etiology of the condition which might be of aid in its treatment. The patient a woman thirty-six years of age was admitted to the hospital for elephantiac edema of the vulva. Six years previously she had noted a small, hard, and painless tumor in the lower part of the right labium. This had increased in size progressively without causing pain. At the time of her admission to the hospital it presented the typical appearance of cathomene.

About a year before the patient's admission to the hospital a spontaneous fistula had developed in the left perineocrural fold, and since then other fistulae had formed.

The patient's mother died of heart disease at the age of thirty-one years and her father of jaundice at the age of forty-five years.

The patient had had no children but gave a history of one abortion in the sixth month of pregnancy. At the age of seventeen years she was treated by puncture for pleurisy on the left side. This was followed by a persistent pain in the side and irregular dyspnoea. Six years before her admission to the hospital she developed hydrarthrosis of the left knee which required repeated puncture. A yellowish fluid escaped. The condition became cured.

On September 3, 1930, under anaesthesia induced with Bliroth's mixture a large tumor on the right labium majus and a smaller tumor on the left labium minus were removed surgically and the wounds sutured with catgut. A haemorrhoidal lesion was also extirpated. As the urethral orifice had been displaced considerably by the tumors, a stricture of the meatus had resulted. A Pessar dilator was therefore left in place for four days. The patient was discharged in good condition on October 30, 1930.

When she was seen again on June 28, 1931 the left labium majus still showed some hypertrophy. And on the inner surface of the left thigh there remained an elephantiac area with fistulous tracts. A very long fistulous tract coursed toward the perineum, but did not communicate with the rectum. The patient was examined on several occasions after the operation. Although fistulae were constantly present there was no recurrence of the tumor. Two or three years later she died, but the cause of her death was not determined.

The spontaneous multiple painless fistulae, the history of pleurisy and hydrarthrosis, and the fact that the surgical treatment given resulted in a marked diminution in the size of the tumor and prevented recurrence of the neoplasm although it did not cure the fistulae suggest that the condition was tuberculous.

Eithomene of the vulva occurs most frequently in old prostitutes with a local or general predisposing condition. It is favored by multiple pregnancies, abortions, repeated exposure to venereal disease, alcoholism, anemia, and poor hygienic conditions. Frequently the patient gives a personal or family

history of tuberculosis. The lesion has been ascribed to tuberculosis, syphilis, and disturbances of the lymphatic circulation.

The question has been raised as to whether eithomene is a pathological and clinical entity or represents only a type of evolution of ordinary elephantiasis. Verchere and Baudier and more recently Denis and Delaunay characterized it as a type of ordinary ulceration. Dubreuilh and Brous in 1894, and Dupuy and Reuillere in 1907 concluded that it is a trophic ulceration. In some cases the latter hypothesis seems to be confirmed by the pathological anatomy.

The lesions of anogenital sclerema resemble those of elephantiasis following ulcer. The epithelium shows epithelial prolongations and the dermis is extraordinarily thick because of the proliferation of elastomeres connective tissue. The lymph vessels are dilated and gorged with leucocytes, and each of them is surrounded by an area of inflammatory infiltration.

Clinically two types of eithomene of the vulva are distinguished—an erythematous type and is ulcerous hypertrophic vegetating type such as that occurring in the case reported by the author.

According to the classical description, the clinical picture is characterized by ulceration, hypertrophy and stenosis. In the author's case ulceration was not present. The deformity is usually asymmetrical and may be unilateral or bilateral. As a rule the labia majores are involved.

The prognosis of anogenital tuberculosis is less favorable than that of syphilitic elephantiasis.

Histological examination of the specimen removed in the author's case revealed giant cells of a tuberculous type without any signs of tuberculous follicles, and chronic inflammatory perivascular lesions such as occur in infection by the hematogenous route. No Koch bacilli were demonstrable, but this may be explained by the fact that the specimens were not examined until they had been kept in Kahle's solution for some time.

The differential diagnosis of eithomene of the vulva is not always easy. Soft chancres of the syphilitic type, torpid cancer of the vulva, and tertiary syphilitic ulceration may give rise to similar changes.

The treatment should be both general and local. General treatment may include according to the requirements of the given case, anti-syphilitic or anti-tuberculous treatment. Local treatment should be surgical and medical. Medical treatment consists in antiseptic lavage, careful hygienic measures, and absolute sexual rest. Cauterization, which was commonly used formerly in this condition, seems to have been abandoned. Surgical treatment may be supplemented by radiotherapy. The lesions may be extirpated by typical or typical vulvectomy. If radiotherapy is used, the exposures must not be too prolonged or too frequent as radiodermatitis is especially apt to occur in the vulvar region.

LEON B. MOORE

muscles. It may result also from disorders of the central nervous system, primary insufficiency of the sphincter, or nervous disturbances without an organic basis (psychic). Incontinence due to congenital anomalies or an abnormal communication between the bladder or ureter and the genital tract as a result of trauma (fistula) does not belong, in a strict sense, to the category of incontinence of the urinary bladder in the female. Incontinence is considered permanent when it is present regardless of the position of the body. Relative incontinence is incontinence in the standing position or from increased intra-abdominal pressure (coughing, straining).

The sphincter of the female bladder differs somewhat in function and structure from that of the male bladder. In the female the bladder is closed by juxtaposition of the anterior and posterior walls of the urethra brought about by contraction of the sphincter urethrotrogonalis. The tangential direction of the urethra and the weight of the full bladder also aid in the occlusion of the urethra.

For the surgical correction of incontinence due to failure of sphincter control the author recommends the operation described by Goebell, Frangenheim, and Stoeckel. This procedure aims to reconstruct the sphincter by means of the pyramidalis muscle and the fascia of the rectus abdominis. Each pyramidalis muscle attached to the rectus fascia is carefully dissected down to the point of insertion at the upper border of the symphysis. The two strips of muscle and fascia are carried down behind the symphysis and joined to form a sling for the neck of the bladder. Good results have been obtained even when the pyramidalis was not present, as is frequently the case.

The author reports a case in which this operation was performed successfully, after other methods had failed. The technique is shown in illustrations. He believes that the success of the operation depends upon the formation of a cicatricial ring, and that there is no real muscle sphincter as the muscle fibers degenerate soon after they have been severed from their nerve supply.

The operation described is preferable to interposition operations because it does not interfere with pregnancy. Most surgeons caution against attempts at normal delivery after its performance, but Mandelstamm reported a case in which normal delivery was without ill effects.

Successful treatment of urinary incontinence requires accuracy of diagnosis and careful consideration of the features of the given case. Operative failures are often due to failure to recognize the cause of the incontinence. HAROLD C. MACK, M.D.

Vincent, G. Lesions of the Pelvic Ureter Occurring During Gynecological Interventions (Les lésions de l'uretère pelvien produites au cours des interventions gynécologiques). *Bull. Soc. d'obs. et de gynec. de Par.*, 1932, **xxi**, 203.

The author reports four cases in which the pelvic ureter was injured during a gynecological operation.

The first case was that of a woman of thirty-five years who was subjected to total hysterectomy for cancer. Section of the left ureter was followed by the formation of a ureterovaginal fistula and by suppurative pyelonephritis necessitating nephrectomy. Recovery ultimately resulted.

In the second case the right ureter was injured during total hysterectomy. A ureterocutaneous fistula formed, but healed spontaneously.

In the third case an injury of the ureter during salpingectomy for acute adnexitis was followed by a ureterocutaneous fistula which healed spontaneously.

The fourth case was that of a woman of thirty-two years who had a stricture of the ureter following subtotal hysterectomy and complained of pains of a nephritic type. Retrograde pyelography was done. Improvement followed treatment by dilatation.

The frequency of such injuries is explained by the anatomical relations of the ureter in the female pelvis. The lesions may be due to section, ligation, laceration or secondary necrosis. Operative injury may occur at any point in the course of the ureter, but is most frequent in the upper part of the pelvis near the ovarian pedicle and in the ovarian fossa, and in the broad ligament.

In the upper part of the pelvis the ureter may be included in the ligature of the utero-ovarian pedicle, being hidden by adhesions. During the liberation of adherent adnexa the ureter may be incised or severed. If hemostatic clamps are placed too low on the broad ligament the ureter may be injured at the site of its entrance into that ligament.

The ureter is injured most frequently in the broad ligament in vaginal hysterectomy and in operations for genital prolapse, especially anterior colpectomy, certain colpotomies, and hysterectomies of the Wertheim type for uterine cancer.

In some cases the ureter may be displaced by tumors of the broad ligament, uterus or adnexa.

Complete ligation of the ureter causes abrupt inhibition of renal function. In some cases this leads to physiological nephrectomy. In other cases pyonephrosis develops necessitating secondary nephrectomy. If the ligation is bilateral or there is only one kidney, anuria results. If the ligature is not removed, uræmia leads to death in from six to eight days.

Incomplete ligation of the ureter does not manifest itself until several days after the operation. The course is similar to that following transverse section.

Longitudinal section usually heals spontaneously and only very rarely leads to stricture. Transverse section is much more serious. According to whether the escaping urine forces its way through the skin, the vagina, the cervix or the peritoneum, a ureterocutaneous fistula, a ureterovaginal fistula, a ureterocervical fistula or postoperative peritonitis results. The fistulae show a tendency toward spontaneous obliteration resulting in dilatation of the ureter and the renal pelvis, and atrophy of the kidney. If

the injection of the Iodolol, roentgenograms are made and the patency of the tubes is determined from the position and shape of the shadows.

**Uterine segment.** The uterine cavity is so large that it can be blocked only by a tumor of considerable size within it. The great majority of large intra-uterine tumors are fibromata.

Sterility is often ascribed to an "infantile" state of the uterus, but this is evidently incorrect as the oöperm can graft in the isthmus of the tube which is far smaller than the smallest "infantile" uterus. The frequent association of sterility with small size of the uterus is due to the fact that the tubes of women with a small uterus are often congenitally impervious or only poorly pervious, and deficient development of the uterus is often associated with deficient development of the ovaries.

**Cervical segment.** Absolute obstruction of the cervical canal is very rare, but undue narrowness is common. Dilatation of the cervix for the cure of sterility has been a standard operation for a great many years, but because of the small size of the sperm in relation to even the narrowest cervical canal it is difficult to see how this intervention acts.

**Vaginal segment.** The cavity of the vagina is so large that its total occlusion except by a congenital defect is rare. The best example of total occlusion is the so called "imperforate hymen." However narrowness of the vaginal entrance sufficient to prevent coitus is extremely common.

It is generally thought that, in certain cases, sterility is due to structural unsuitability of the endometrium for grafting of the oöperm. However when it is borne in mind that grafting may occur into the substance of the ovary, the wall of the tube, and even the peritoneum, tissues differing greatly not only from the endometrium but also from one another, it seems difficult to believe that comparatively slight histological changes in the lining of the uterus can completely check the activities of the trophoblast.

In all cases of sterility without an obvious cause the husband should be examined with regard to his physical condition and the state of his semen. The semen should be examined microscopically immediately after it has been passed.

The wife should be questioned and subjected to a physical examination and a tubal insufflation test. In carrying out the insufflation test it should be remembered that failure to get air to pass along the tubes, though usually due to fixed conditions, may be dependent upon a temporary cause such as thickening of the cornal endometrium or muscular spasm at the tubo-uterine junction.

Many women, though they are anxious to have a child, do not desire it sufficiently to make them willing to undergo an abdominal operation to make pregnancy possible.

In some cases the presence of marked retroflexion of the uterus, uterine fibroids, thickening in the region of the tubes, or a history strongly suggestive of salpingitis makes it practically certain that the

failure of air to pass is due to a fixed condition. In such cases repetition of the test is unnecessary before the abdomen is opened.

Blockage at only the abdominal ostium is the easiest variety of obstruction to treat as it requires merely simple salpingostomy. The extremity of the tube should be separated from its attachment to the ovary by dividing the ovarian ligament, and the bulbous end should be slit sufficiently to allow a coil (like the cuff of a drawing gown sleeve) to be turned back and fastened with a few fine catgut sutures. Kinks are a more difficult problem, but as a rule the tube can be straightened out so that air will pass by traction aided by minute incisions through the peritoneal bands holding the kinks.

Blockage at the uterine ostium requires reimplantation of the tubes into the uterus.

Whatever method is used to open the tubes, all adhesions around the ovaries should be cleared away. In most cases it is advisable to rule the uterus and appendages out of the pelvis by shortening the round ligaments. If the uterus is retroverted this should always be done.

Fibroids causing sterility should be removed by myomectomy.

In Bonney's opinion dilatation of the cervix favors conception, but does not have this effect nearly so frequently as is commonly claimed.

In some cases, failure to conceive is due to hyper-erect penetration during intercourse. In nearly all such cases the vaginal orifice is unduly narrow and rigid and the pain produced causes a reflex spasm which increases the difficulty. The orifice should be enlarged by a plastic operation.

Failure of the ovaries to produce eggs can be proved only by inspection through an abdominal incision.

Pregnancy sometimes follows the administration of endocrine extracts just as it sometimes follows mud baths, spa treatment, and suggestion. However, Bonney warns against the credulity which is readily recognized in laymen, but perceived only with effort in members of the medical profession.

In conclusion Bonney says that under normal conditions the sperms are not injected into the uterus; they find their way there of their own accord. The great drawback to artificial insemination of the uterus is the infrequency with which it can be carried out. A far better procedure is injection of the semen into the upper vagina by means of a syringe. The husband and wife should be instructed how to do this so that it can be carried out frequently.

CARL H. D. VAN, M.D.

De Azavedo, G. V. Urinary Incontinence Treated by the Goebell-Franzenheim-Strauch Operation (L'Incontinence d'urine et son traitement par l'opération de Goebell-Franzenheim-Strauch). *Rev. Soc. Am. de med. et de chir.* 922, 12, 29.

Incontinence of the urinary bladder is most common in multiparae past the age of forty years and is due usually to a mechanical lesion of the sphincter

# OBSTETRICS

## PREGNANCY AND ITS COMPLICATIONS

Hottelung, H., and Hotelling, F. A New Analysis of Duration of Pregnancy Data. *Am J Obst & Gynec*, 1932, xiii, 643

The belief of the earlier obstetricians that the average duration of normal pregnancy (very short and very long pregnancies being excluded) is two hundred and eighty days was confirmed by the authors' study. However, the standard deviation from this average, which others have estimated to be from eight to ten days, the authors found to be eleven days. If the early births are included, the mean duration is shorter and the standard deviation is greater.

The mean duration from the date of coitus to birth is two hundred and seventy-one days, the standard deviation being scarcely any less than when the duration is counted from the beginning date of the last menstruation. The standard deviation also seems to be no less when the duration is counted from the last day of the last menstruation, as in England and France. Accordingly, there is no perceptible gain in accuracy in reckoning even from a single coitus of known date unless, of course, the menstruation date is unknown.

In different races both the mean duration of pregnancy and the standard deviations are significantly different. However, contrary to the opinion of Labouré, the mean and standard deviations are practically unchanged if cases such as those of still-birth, cesarean section, and venereal disease are excluded.

No significant difference appears in either the mean length or the standard deviation between the first and later pregnancies. The age of the mother seems likewise to be without effect.

In support of the argument based on analogy with cows, horses, and other animals, that individual mothers differ greatly from each other in the average length of pregnancy, the authors state that of eighty-nine women delivered of more than one child at Lane Hospital, San Francisco, the differences in the average duration of pregnancy in the different women were significantly greater than the differences between the pregnancies of each woman.

Contrary to the belief of some that in the duration of pregnancy there are just as many deviations of each magnitude on one side of the mean as on the other, the authors find that the cases are concentrated about the mean in such a way as to indicate a variable disturbing factor other than the date of impregnation. In fact the shape of the curve of duration suggests that it is safe to assume that the birth is more likely to occur before the average time than after it.

A large part of the abnormality of the curve may be explained by the hypothesis that approximately 10 per cent of the menstruation-to-birth durations were really one month longer, possibly because of the occurrence of a "false menstruation" after the beginning of the pregnancy. However, in order to make these durations fall into a theoretically normal distribution, it must be assumed further that the false menstruation occurred, not twenty-eight days, but from thirty-two to thirty-five days, after the last true menstruation.

E. L. CORNELL, M.D.

Catalano, O., and Rossi, D. Experiences in Placentography (Esperienze di placentografia). *Rassegna internaz di clin e terap*, 1932, viii, 284

The authors were able to obtain placental roentgenograms by the intravenous administration of colloidal thorium (thorotrast). In this preliminary report of their investigations they show that the placental roentgenograms reproduce in general the anatomical structure of the placenta. Passage of the thorium salts from the mother to the fetus could not be demonstrated with the X-ray. It seemed to be prevented by the placental barrier.

PETER A. ROSI, M.D.

Crispolti, E. The Influence of Fetal Endocrine Glands on the Motor Activity of the Uterus (Influenza di ghiandole endocrine fetali sulla attività motora dell'utero). *Riv Ital d ginec*, 1932, xiii, 347

The author studied the effect of fetal endocrine glands on the uterine muscle of pregnant and non-pregnant animals.

Extracts of the hypophysis and of the male and female sex glands in small doses caused a pronounced contractile activity with a considerable increase in the tone of the muscle. Larger doses had an inhibitory effect.

Thyroid and spleen extracts tended to regulate the rhythm of contraction and to produce a moderate increase in the tone of the uterine muscle.

Pancreatic extracts, even in minimal doses, had an inhibitory effect although they gave rise to hypertonicity.

Suprarenal and thymus extracts had no effect on the uterus.

The activity of the fetal endocrine gland extracts on the motility of the uterus was demonstrated for the thyroid and hypophysis from the fifth to the sixth month of intra-uterine life, and that of the other glands, after the seventh month. The author believes that these fetal glands modify the endocrine equilibrium in the mother and are a factor initiating and regulating uterine activity during gestation.

PETER A. ROSI, M.D.



infected, they may give rise to ascending pyelitis. Pyelonephritis with retention results in pyonephrosis with fairly rapid destruction of the kidney.

Stricture is followed sooner or later by hydronephrosis. In some cases it is well tolerated and symptoms of infection remain absent for a considerable time. In a case reported by Constantin and Bernasconi, symptoms of infection did not develop until twelve years later.

A lesion of the ureter due to ligation is rarely recognized during the operation. When the ureter is sectioned the escape of urine may be noticed. During the days following the operation the diagnosis of injury to the ureter is based on the appearance of a fistula. In cases of ureterocutaneous fistula the dressings will be found saturated with urine. In cases of ureterovaginal fistula the patient will complain of constant loss of urine through the vagina. In some of these cases examination with a speculum will show the urine oozing into the vagina. It is then necessary to determine whether a vesicovaginal or a ureteral fistula is present. The injection of dye into the bladder is usually of aid, but is not infallible as the fistular opening may be too narrow to permit escape of the dye or both the bladder and

the ureter may have a vaginal communication. In doubtful cases, cystoscopic examination after the intramuscular injection of a dye which is excreted through the kidney (methylene blue or indigo carmalum) is indicated. This will reveal the state of the vaginal mucosa and show whether the ureteral orifice is functioning properly. If pus escapes through the ureteral orifice a renal infection is probably present. Subsequently ureteral catheterization may be attempted to determine the permeability of the ureters and to collect urine from the two kidneys separately to determine their functional capacity.

After the operative period has passed, renal function should be tested again. Stricture may be excluded by ureteral catheterization and ureteropyelography. In some cases intravenous pyelography is of value.

The treatment of surgical injuries of the ureter is not easy. In some cases a choice must be made between ureterorrhaphy and implantation of the ureter into the bladder, rectum, or skin. As the results of these methods are only mediocre, nephrectomy when possible, is to be preferred. Deep roentgen therapy has also been used with success to suppress renal function. Latta & McKee.

Tranquilli-Leali, E. Incompatibility of the Paternal and Maternal Blood Groups as a Constitutional Cause of Abortion (Disaffinità del gruppo sanguigno paterno materno quale causa costituzionale di aborto) *Riv. ital. di ginec.*, 1932, **xiii**, 490

The author reviews the properties of blood as regards blood grouping, abortion in general, and some of the more recent work relating to blood groups. In a study of forty-one cases of abortion without apparent cause he found incompatibility of the paternal and maternal blood groups in a large proportion.

A. Louis Rosti, M.D.

### LABOR AND ITS COMPLICATIONS

Mayes, H. W. The Development of the Mercurochrome Technique in Obstetrics. A Report of 10,000 Cases, 5,000 of Which Were Studied During the Experimental Stage. *Surg., Gynec. & Obst.*, 1932, **lvi**, 529

Mayes endeavored to supplement sterilization of the hands and instruments preparatory to delivery by the use of antiseptics in the vagina. After a six-year study of vaginal antiseptics in over 10,000 deliveries he has developed the following mercurochrome technique.

On the patient's admission to the hospital the pubic hair is shaved, the perineum and surrounding field are cleansed with green soap and water, and the external genitalia and surrounding area are sprayed with a 4 per cent aqueous solution of mercurochrome. With the use of a vaginal syringe containing 3 dr. of the same antiseptic the vagina is distended with the solution by holding the labia closely around the deeply inserted syringe. The excess mercurochrome which escapes as the syringe is withdrawn is taken up with the syringe or sponges. A thick pad is placed under the patient to absorb the spill and prevent staining of the bed linen.

During labor the perineum is cleansed of dried blood and mucus every two or three hours and the spraying and instillation of mercurochrome are repeated every twelve hours.

For delivery, the perineum and surrounding area are cleansed with 3 or more moist, sterile sponges, then dried with a sterile towel, and then sprayed with a solution of 4 per cent aqueous alcohol acetone mercurochrome. After the pelvic floor is depressed, 2 dr. of the aqueous solution are introduced into the vagina.

For operative deliveries, lacerations, or episiotomies, more of the aqueous solution is introduced into the vagina and into the wounds. In the induction of labor with a bag the procedure is the same as for delivery. If the membranes have been ruptured for any considerable time or if the uterine cavity is considered potentially infected, 3 oz. of a 1 per cent solution of mercurochrome may be injected into the uterus through a catheter placed alongside the bag.

For cesarean section the preparation is the same as that carried out on the patient's admission to the

hospital, and for potentially infected cases the 3 oz. of the 1 per cent solution are injected into the uterus. After the removal of the placenta, 1 oz. of a 4 per cent solution of mercurochrome is poured into the uterine cavity.

The postpartum care includes daily spraying of the perineum with a 4 per cent aqueous solution of mercurochrome. In cases of severe lacerations or vaginitis, 2 dr. of a 4 per cent solution of mercurochrome are instilled in the vagina daily.

For dilatation and curettage including abortions and miscarriages the usual preparation for delivery is carried out and 2 dr. of mercurochrome are carefully introduced into the uterine cavity.

In 2,072 cases before the use of mercurochrome the morbidity was 12.4 per cent, in 5,076 vaginal deliveries during the development of the mercurochrome technique, it was 8.9 per cent, and in 5,102 cases in which the described mercurochrome technique was used, it was 5.6 per cent. The average duration of morbidity and the incidence of morbidity were decreased.

A. F. LASH, M.D.

Corda, G. M. The Etiology and Pathogenesis of Cases of Spontaneous Rupture of the Uterus (Sulla etiologia e patogenesi di alcuni casi di rottura spontanea dell'utero). *Folia gynaecol.*, 1932, **xxix**, 1

The author reports three cases of spontaneous rupture of the uterus observed in the obstetrical clinic in Pisa. In the first case, that of a para-ii, the rupture occurred in the scar of a cesarean section performed about three years previously on account of contracted pelvis. It had probably occurred about four days before the patient entered the clinic. In spite of surgical intervention, death resulted. Corda calls attention to the fact that the increased frequency with which cesarean section is done today increases the likelihood of rupture in an old scar.

In the second case reported there was hydrocephalus of the fetus which had not been diagnosed before the onset of labor. During labor two injections of pituitrin were given. Histological examination showed absence and dissociation of fibromuscular fibers. The defects may have antedated the labor, constituting a point of lowered resistance, or may have resulted from the violent labor.

In the third case the rupture was due to contracted pelvis.

The article is supplemented by an extensive bibliography.

EUGENE T. LEDDY, M.D.

Rocmans, M. The Place of Low Cesarean Section in Obstetrical Practice (La place actuelle de la césarienne basse dans la thérapeutique obstétricale). *Bruxelles méd.*, 1932, **xii**, 677

In low cesarean section the uterus is opened where its wall is thin, non-contractile, easy to suture, and avascular, and the suture line is in a well-protected region of the small pelvis. These advantages easily offset the slight disadvantage that the technique is more complicated than that of the classical cesarean

Stander, H. J., Ashton, P., and Cadden, J. F.: *The Value of the Various Kidney Function Tests in the Differentiation of the Toxemias of Pregnancy*. *Am J Obst. & Gynec.*, 1932, xliii, 46.

The authors studied various tests of renal function with regard to their value in the recognition of a beginning or mild nephritis with symptoms and signs which may be confused with those of a low reserve kidney or pre-eclampsia.

Of the *inulin*, *phenolsulphophthalein*, *dis-tase*, *thiosulphate*, *urea-concentration*, *urea-clearance*, *guanidin-excretion*, and *creatinin-excretion* tests, the last three were found of most aid in the differentiation between mild nephritis and the other toxemias of pregnancy.

The authors recommend the *urea-clearance* and *creatinin-excretion* tests for routine use in all cases of toxemia of pregnancy in which the diagnosis is not clear. They state that a *urea clearance* below 80 per cent of the mean normal and a *creatinin excretion* below 355 mgm. in the first hour are strongly indicative of renal damage. E. L. CONNELL, M.D.

Kaplan, S.: *Blood Chemistry Study in Normal Pregnancy and Eclampsyogenic Toxemia*. *Am J Obst. & Gynec.* 1932, xliii, 673.

The author's findings are summarized as follows:  
1. The non-protein nitrogen of the blood increases from 24 mgm. per 100 c.cm. in the third month to 35.27 mgm. per 100 c.cm. in the ninth month of pregnancy.

2. The uric acid shows a slight increase during the ninth month.

3. The sugar content of the blood is diminished from 84.3 mgm. per 100 c.cm. in the third month to 70.47 mgm. per 100 c.cm. in the ninth month.

4. In pre-eclamptic toxemia the non-protein nitrogen, urea nitrogen and uric acid show a slight increase over that found in normal pregnancy and return to normal in six weeks.

5. In eclampsia, the non-protein nitrogen, urea nitrogen, and uric acid show a greater increase than in pre-eclamptic toxemia but a similar return to normal.

6. In nephritic toxemia the nitrogenous constituents of the blood show a more marked increase than in any of the conditions mentioned and do not return to normal within six weeks after delivery. E. L. CONNELL, M.D.

Anselmino and Hoffmann: *The Relation Between the Increase in the Content of Hormone of the Posterior Lobe of the Pituitary in the Blood and the Occurrence of Nephropathy and Eclampsia in Pregnant Women* (*Ueber die Bedeutung des gesteigerten Gehaltes des Blutes Hypophysenhinterlappenhormon zur Entstehung der Nephropathie und Eklampsie der Schwangeren*). *Arch f. Gynecol.*, 1931, cxli, 506.

An increase in the antidiuretic and probably also in the vasopressor components of the hormone of the posterior lobe of the pituitary gland having been

demonstrated in the blood in nephropathy and eclampsia, the authors compare the most important clinical symptoms of these conditions with the effects of the hormone of the posterior lobe of the pituitary gland.

This comparison shows complete agreement of most of the more important individual symptoms. First among the latter are water retention from checking of diuretics, an increase in the blood pressure, capillary spasms, the development of oedema, convulsions, and pulmonary oedema, a decrease in the response to galvanic stimulation and certain shifts of the ions from the blood into the tissues. The symptoms are relieved by *diuretic*, *sedatives* and *hypocotics*. The quantitative determination of the hormone in the blood revealed a parallelism between the hormonal concentration and the severity of the clinical symptoms. The clinical symptoms must therefore be regarded as the result of poisoning from the posterior lobe of the pituitary gland. It is therefore demonstrated that the nephropathy and eclampsia of pregnant women are caused by disturbances of internal secretion. Foremost of these disturbances, dominating the clinical picture, is an uncompensated overproduction of the antidiuretic components of the hormone of the posterior lobe of the pituitary gland and, in cases with heightened blood pressure, an increased production of a substance which increases the blood pressure and is probably identical with the vasopressor component of the hormone of the posterior lobe of the pituitary gland. ANSELMINO (M).

Dickmann, W. J.: *Osteomalacia in Pregnancy*. *Am J Obst. & Gynec.*, 1932, xliii, 476.

The early diagnosis of osteomalacia in pregnancy must be made from the symptoms and from the evidence of calcium deficiency determined by metabolism studies or an analysis of the diet. In the early stages of the condition the serum calcium is not always subnormal and the bones do not show signs of absorption perceptible in the roentgenogram.

There is a definite association between pregnancies at short intervals, an insufficient or improper diet, the occurrence of pain in the symphysis, back, and thighs, and difficulty in walking.

The diet of the pregnant woman should be carefully regulated. It should contain at least 1 g.m. of calcium and 0.6 gm. of phosphorus daily and should include also a sufficient quantity of butter, milk, fresh vegetables, and fruits to assure an adequate supply of vitamins. In the case of many pregnant women, especially those in poor economic circumstances and those of colored women, the diet should be supplemented with calcium and cod liver oil.

When calcium is supplied, the women will have less disability due to calcium deficiency and less decay and softening of the teeth. In the case of the infants there will be less danger of rickets and the deciduous teeth, which are formed during late uterine life, will have the proper composition and be less likely to decay. E. L. CONNELL, M.D.

# GENITO-URINARY SURGERY

## ADRENAL, KIDNEY, AND URETER

Broster, L. R., Gardiner Hill, H., and Greenfield, J. G. The Adrenogenital Syndrome Associated with Cortical Hyperplasia, Results of Unilateral Adrenalectomy *Brit J Surg*, 1932, **xix**, 557

The association of lesions of the adrenal cortex with hirsutism and virilism in females is now designated as the "adrenogenital syndrome." The pathological lesion in the adrenals may be a diffuse cortical hyperplasia or a neoplasm. The latter may be either benign (adenomatous) or malignant. Both of the tumor varieties are usually referred to as "hypernephromata," but must be distinguished from the so called hypernephromata of renal origin, the Grawitz tumors, which are not associated with sex changes. Cases of the adrenogenital syndrome due to tumors have frequently been reported, but less attention has been paid to the form associated with hyperplasia of the adrenal cortex.

As Mathias has pointed out, the influence of the adrenal lesion may be manifested in different ways, depending chiefly upon the type of the lesion and whether the subject at the time of onset of the condition is immature or fully developed. Because of its slow growth, hyperplasia is not likely to produce such rapid changes in the sexual sphere as a malignant tumor. The course of the benign adenomata is intermediate between the two. In cases of malignant tumor the neoplasm is usually so rapidly fatal that radical developmental changes are seldom noted.

Unilateral adrenalectomy has been performed by the authors in three cases representing three different types of the adrenogenital syndrome associated with hyperplasia of the adrenal cortex, namely, pseudohermaphroditism, virilism or hirsutism, and the Achard-Thiers syndrome (diabetes of fat bearded women). The three patients are in good health at the present time, three years, ten months, and ten months respectively after the operation. In none of the cases were untoward postoperative symptoms observed. The blood pressure did not vary during or after the operation.

The effects of unilateral adrenalectomy on the chief symptoms of the syndrome, the hypertrichosis and sex changes, were not the same in the three cases. In the late syndrome—the case of adrenal virilism—markedly beneficial results were obtained, but in the early form—the case of pseudohermaphroditism—and in the case presenting the Achard-Thiers syndrome (probably a pluriglandular disturbance) no change in the symptoms was observed.

The authors' experience therefore suggests that unilateral adrenalectomy is indicated in the late syndrome—virilism—due to hyperplasia of the

adrenal cortex when the adrenal lesion is mainly unilateral, but not in the two other forms.

C. TRAVERS STEPITA, M.D.

Ball, R. G., Greene, C. H., Camp, J. D., and Rowntree, L. G. Calcification in Tuberculosis of the Suprarenal Glands *J Am M Ass*, 1932, **xcviii**, 954

It appears from the authors' studies that lesions of the suprarenal glands are roentgenographically demonstrable in a certain proportion of cases in which there is tuberculous involvement. The more chronic pathological changes with fibrocascation or calcification seem to be most easily demonstrated roentgenologically. In the majority of cases the active disease process probably destroys sufficient cortical tissue to cause death before fibrocascation or calcification occurs. In cases of Addison's disease due to simple cortical atrophy the roentgenogram would obviously be negative, but in borderline or questionable cases of Addison's disease, positive roentgenographic evidence would be a valuable diagnostic aid. Therefore in the group of cases in which, though symptoms of Addison's disease are present, the clinician hesitates to make a diagnosis of Addison's disease, a careful roentgen study of the suprarenal region would seem advisable. On the other hand, it must be remembered that suprarenal tuberculosis of marked degree, especially if unilateral, may be present without sufficient clinical evidence of suprarenal insufficiency to warrant a diagnosis of Addison's disease.

In cases in which the diagnosis of Addison's disease is unquestioned and there is a definite history or evidence of tuberculous infection, the lesion in the suprarenal glands is almost certainly of a tuberculous nature. It has been observed by Rolleston and Bramwell that the cases due to active tuberculosis respond less satisfactorily to treatment than those with simple atrophy. This is also the impression gained by the authors. When active lesions are present in the lungs an attempt is made to arrest or heal them. A similar attempt might be considered with regard to the suprarenal glands, although it is necessary to bear in mind Rolleston's case in which the cortical insufficiency was attributed to cicatricial contraction in the calcifying glands. The advisability of attempting to promote healing by such measures as a dietary regimen, the administration of viosterol and calcium, the judicious use of parathormone or the roentgen rays, is to be considered. The results of such attempts might be studied by making roentgenograms of the suprarenal regions during and after the treatment.

The authors report six cases of Addison's disease with shadows in the region of the suprarenals.

section. The low cesarean section has a lower maternal and infant mortality than the classical operation not only in clean cases, but also in infected cases. In four large series of statistics the average fetal mortality was 6.3 per cent. Peritonitis, shock, and hemorrhage are less frequent after the low cesarean section. Postoperative eversions and uterovaginal fistulae are exceptional but occasionally bladder fistulae occur. Rupture of the uterus is approximately ten times less frequent than after the classical procedure.

Following a discussion of the indications and contra-indications of low cesarean section, the author concludes that this operation is superior to the old method and should be practiced more extensively.

GEZ DE TAZAIE, M.D.

### PUERPERIUM AND ITS COMPLICATIONS

Couvelaire, A.: The Treatment of Late Puerperal Hemorrhages (*Traitement des métrorragies tardives des suites de couches*). *Gynecologie* 95, 1930, no. 144.

The metrorrhagias which follow delivery after some delay have been attributed to a variety of causes. For a long time they were believed to be the result of faulty uterine tone and circulation. This theory led to treatment with ergot, digitalis, ferric chloride, heat and cold, and blood transfusion.

In 1870 Hervey called attention to the importance of infection and recommended the intra-uterine injection of caustic substances to coagulate the blood and promote uterine contraction.

In the beginning of the present century retained placenta was regarded as the most important factor, and Pinard, Doléris, and Champetier de Ribo advised curettage. Bouilly introduced the digital method of curettage.

During recent years Couvelaire and his associates have demonstrated that placental retention is not always present and have again emphasized the importance of uterine infection. Couvelaire states that the hemorrhages are often the manifestation of a "septicohæmorrhagic" syndrome. Two facts militate against intra-uterine treatment. Curettage, even digital is often unsatisfactory. In some cases nothing may be detected thereby and in others a lamella of uterine muscle may be mistaken for a fragment of placenta. Moreover manipulation is frequently followed by a violent febrile reaction. Accordingly there remains only the choice between purely medical treatment and immediate hysterectomy. Medical treatment consists of transfusion, the use of vaccines and antiseptics, and the production of a fixation abscess. The status of hysterectomy remains uncertain. The operation can be of value only when it is performed early.

ALAN F. DEGROOT, M.D.

renal parenchyma, and the use of X-ray control during the operation

In Heitz-Boyer's cases the general pre-operative treatment consists of the use of vaccines. In addition, local treatment is given through a retention catheter. In this way the kidney can be drained and irrigated with antiseptic solutions, vaccines, or bacteriophages. This pre-operative disinfection renders the operation much less dangerous. The use of the electrical bistoury insures complete hæmostasis and rapid cicatrization. The use of a radio-operating table is very important as it permits roentgenography without danger of electrocution, the high-frequency part of the apparatus being enclosed hermetically beneath the table. When the kidney is exposed a metal grill which is opaque to the roentgen rays is attached to its surface firmly by sutures passed through the fibrous capsule. The method of attaching the grill is shown in an illustration. Lateral and profile roentgenograms are then taken at an angle of about 90 degrees. This can be done without moving the patient as the table can be inclined at an angle of about 47 degrees in each direction. The two plates can be developed in three or four minutes while the surgeon is bringing about hæmostasis and preparing the electrical bistoury. As the plates show the exact location of the stone or stones, the latter can be removed with relatively little trauma to the kidney. After removal of the calculi, another roentgenogram is taken to see that no stones have been left behind.

AUDREY GOSS MORGAN, M D

Pauchet, LeGac, Luquet, and Hirschberg. Four Large Tumors of the Kidney (A propos de quatre tumeurs rénales volumineuses). *Bull et mém Soc d chirurgiens de Par*, 1932, **XXX**, 70

Only one of the four cases reported by the authors presented renal symptoms such as nephritic colic and hæmaturia. In the three others the tumor was almost the only sign. In one case it suggested a tumor of the spleen, in another, a tumor of the mesentery, and in the third, a tumor of the colon. In the case in which it simulated a tumor of the spleen the roentgenogram showed an exaggerated convexity of the dome of the diaphragm with lowering of the splenic flexure of the colon. Therefore this finding can no longer be considered pathognomonic of tumor of the spleen. The site of the tumor in the three cases was discovered at operation. As the blood urea was satisfactory and the other kidney could be palpated, nephrectomy was performed.

These cases show how slight the symptoms of large kidney tumors may be. The diagnosis of such neoplasms can be made only by pyelography with uroselectan or tenebryl or by catheterization of the ureters. In the authors' cases, operation was performed by the transperitoneal route. In two cases an oblique subcostal incision was used. This made it possible to spare the rectus by opening the two folds of its sheath. In the two other cases the incision was transverse and para-umbilical. The trans-

peritoneal route is much superior to the posterior route as its use prevents duodenal and colonic fistulæ and insures complete hæmostasis. In the cases reported, operation would have been difficult with ether or chloroform anæsthesia, but with spinal anæsthesia (induced with percain in three of the cases) it was comparatively easy and free from operative complications.

Three of the tumors were epitheliomata and one was a sarcoma. One of the patients died. One is well and free from recurrence a year after the operation although it was feared that a recurrence might develop within six months. The two others are still living, but the prognosis in their cases is reserved.

AUDREY GOSS MORGAN, M D

Lozzi, V. The End-Results of Decapsulation and Enervation of the Kidney (Risultati lontani della decapsulazione ed enervazione renale). *Policlin*, Rome, 1932, **XXXIX**, sez. chir. 84

The author reports the end-results of decapsulation of the kidney in eighteen cases and of enervation of the kidney in two cases. Tests with indigocarmin and phenolsulphonphthalein revealed no injurious effects on the function of the kidney. The conclusions drawn are as follows:

1. Renal decapsulation and renal enervation have the same vasomotor effect on the renal vascular system.
2. Renal decapsulation causes no immediate or delayed injury of renal function.
3. In reflex anuria renal decapsulation promptly re-establishes diuresis.
4. In hæmaturic chronic nephritis with pain, renal decapsulation is the method of choice.
5. In perinephritis with adhesions and pain, renal decapsulation results in immediate and definite relief.
6. In the absence of definite indications (borderline cases) renal decapsulation gives immediate and lasting satisfactory results. F M COCHEMIS, M D

Cabot, H., and Holland, W. W. Nephrostomy Indications and Technique. *Surg, Gynec & Obst*, 1932, **LIV**, 817

Nephrostomy is indicated by the presence of obstruction which cannot be satisfactorily remedied by some other method. In general, it may be considered for the following conditions:

1. Acute obstruction of both ureters or a remaining ureter such as may occur in calculous anuria or malignant disease constricting the lower end of the ureter.
2. Hydronephrosis with or without infection in which the cause of the obstruction may be removable, but drainage of the kidney is indicated as a temporary measure to improve function. In some cases in this group a permanent nephrostomy may be necessary.
3. Renal calculi. There are at least two distinct groups of cases of renal calculi in which a temporary or permanent nephrostomy may be desirable. In one group are those in which there is considerable

Brisson, P: Retrograde Ureteropyelography in Hydronephrosis. (*L. uropellografi nell'idro-nefrosi*). *Radial med* 193 217, 359

According to the author a experience, retrograde pyelography permits the diagnosis of hydronephrosis in all of its stages, allows a differential diagnosis of the condition from other renal lesions and anomalies, frequently establishes the pathogenesis, and makes possible the choice of the best therapeutic procedure.

Brisson's results in 500 pyelographic examinations in cases of hydronephrosis are discussed. It was found that the presence or absence of the renal shadow is related to renal function. Brisson believes that the absence of a renal shadow in a correctly made roentgenogram is a sign of renal insufficiency and due to a decrease in the blood supply of the renal parenchyma. A distinct kidney shadow is usually indicative of good kidney function.

Brisson discusses the roentgenographic changes in the minor and major calyces, the renal pelvis, and the ureters in hydronephrosis and presents excellent roentgenograms demonstrating his observations.

In his discussion of the pathogenesis of hydronephrosis he states that the most important factor is mechanical obstruction to the urinary flow from either a congenital or acquired cause. In no case could a spastic obstruction be considered responsible.

PETER A. ROSE, M.D.

Martin, J: Intrarenal Hydronephrosis (Hydronephrose intrarénale). *J. Chir. med. et chir.* 93 2011, 197

In intrarenal hydronephrosis only the calyces are dilated and the pockets thus formed are situated in the interior of the kidney. The renal pelvis presents a normal external appearance, but sometimes is smaller than normal.

Martin reports six cases. In the first case the condition would have been unrecognized if astonished by the appearance of the kidney at operation which did not correspond to the pyelographic picture, Martin had not cut through the obstacle which separated the kidney pelvis from the hydronephrotic cavities. In the second and third cases it would have escaped recognition if Martin had not relied upon the findings of pyelography and removed the kidney.

The absence of retention in the renal pelvis at the time of catheterization should not be considered as eliminating hydronephrosis. In two of the author's cases the urine did not flow out in a gush even when the sound was pushed high. This was doubtless explained by the presence of a calculus which prevented the sound from penetrating the renal pelvis. However the result may be the same when the sound has penetrated into the hydronephrosis.

If it is believed that the dilatation of the calyces is secondary to the presence of a calculus, the anatomical findings in the author's first case—constriction of the renal pelvis just above the calculus and below the dilated calyces—are difficult to understand. If the dilatation of the calyces was due to obstruction of the renal pelvis by the stone, the dilata-

tion would have begun at the level of the stone, but the kidney pelvis was not dilated and the dilations began only at the stricture. It is therefore very doubtful whether the calculus played a role in the development of the hydronephrosis.

The specimen from Case 1 showed exactly the same lesion as the specimen from Case 2 except that there was no stone. No anatomical cause for the dilatation of the calyces could be discovered.

In Case 3 the specimen showed no stone, no anatomical cause for the dilatation, and no stricture between the renal pelvis and the calyces.

In the sixth case mobile stones did not appear to disturb the evacuation of the kidney pelvis and seemed to be secondary to stagnation of filtered urine in the dilated calyces.

With regard to none of the cases can it be said that the hydronephrosis was due to the presence of stones. Martin does not deny that dilatation of the calyces and of the renal pelvis may be of calculus origin (to do so would be to deny experimental and clinical evidence) but he concludes that dilatation of the calyces without dilatation of the renal pelvis such as was found in the cases reported, is a congenital malformation. This theory explains why it is often absent or not very severe and the condition is recognized only when a symptom such as hematuria, rebellious pyuria, or nephritic colic, usually due to an intercurrent disturbance, leads to pyelographic examination.

The treatment is that of a small pelvis hydronephrosis. Removal of the kidney is justified only by an added disturbance or the fear of such a disturbance. It is not warranted by the dilatation of the calyces alone.

PAGE

Heitz Boyer: Operative Techniques for Renal Lithiasis (Sur la lithiase rénale et ses techniques opératoires). *Bull. of intern. Soc. med. et chir. 1934* 1114, 6.

In discussing Papin's report on the operative treatment of renal lithiasis, the author says that he diagnoses with Papin chiefly with regard to the frequency of the indications for conservative surgery and nephrectomy. Papin stated that he employs the two methods with approximately equal frequency whereas Heitz Boyer uses conservative surgery in about 63 per cent of his cases and performs nephrectomy in only 37 per cent. Heitz Boyer believes that in aseptic lithiasis nephrectomy is rarely indicated and in infected cases it should be avoided if possible because the infection is very apt to be of bilateral origin and when the affected kidney is removed the infection persists, calculi are very apt to form in the other kidney and operation on a solitary kidney containing stones is very dangerous.

Conservative operation should be chosen, however only if it can be done without danger to life. The danger may be reduced by active pre-operative treatment, a sufficiently large field of operation to make the kidney readily accessible, the use of the high-frequency electrical bistoury for section of the

metastasis of carcinoma of the prostate, seminal vesicles, or bladder

It is the marked tendency of papillary growths of the renal pelvis to spread by way of the ureter that distinguishes them from solid tumors of the renal parenchyma. The primary growth occurring at a higher level "metastasizes" downward along the ureter with the urinary stream. In many cases only the upper and lower ends of the ureter are involved whereas in others extension appears to take place by continuity, the growth creeping along the ureteral mucosa until the entire surface is involved.

Fowler reports in detail a case of recurrent papilloma of the bladder with secondary ureteral involvement. The patient was under observation for a period of eleven years. The fact that the original tumor presented the same characteristics as the tumor found at autopsy appears to confirm the view that the type or character of cell in these papillary tumors does not change.

The diagnosis of tumor of the ureter appears to offer unusual difficulties and is rarely made when the growth is situated well above the ureteral orifice and is therefore not visible on cystoscopic examination. The diagnostic criteria of greatest value seem to be (1) the presence of an obstruction in the ureter, (2) an increase of the hæmorrhage on contact of the catheter with the growth, (3) a flow of clear urine from a point above the obstruction when the latter is passed by the catheter, and (4) filling defects in the ureterogram.

Fowler emphasizes that ureteropyelography should be carried out in every case of unilateral hæmorrhage from the upper urinary tract in which the cause of the bleeding is not made clearly evident by other means. As a rule the diagnosis requires repeated examinations during the period of active hæmorrhage and in the intervals between attacks.

In the treatment, nephrectomy with partial ureterectomy has been employed most frequently, but as recurrences have often been found in the lower segment after this procedure, aseptic nephro-ureterectomy including the intramural portion of the ureter is now generally done. It may be necessary to perform the operation in two stages.

JACOB S. GROVE, M.D.

## BLADDER, URETHRA, AND PENIS

Valverde, B. Syphilis of the Bladder (A propos de la syphilis vésicale). *J. d'uról méd et chir*, 1932, xxxiii, 142.

Young holds that a positive diagnosis of syphilis of the bladder can be made only when the treponema is found in the vesical lesion. To refute this claim, Valverde makes numerous references to the literature and reports two cases of syphilis of the bladder in which histological examination did not confirm the clinical diagnosis.

In the first case the cystoscopic appearance was that of a syphilitic gumma of the bladder. After twelve days of anti-syphilitic treatment the Wasser-

mann reaction, which had been negative, became positive and the gumma practically disappeared. The bladder capacity increased from 400 to 450 c cm. Histopathological examination of the vegetation removed from the bladder resulted in the following report: "No sign of neoplasm, lesions characteristic of chronic inflammation." The anti-syphilitic treatment was continued. Two months after the first examination the vesical mucosa was completely normal.

In the second case the cystoscopic appearance resembled that of vegetating syphilomata of the bladder. The histopathological report was "Chronic inflammation with hyperplasia of the covering epithelium." During the first three days of anti-syphilitic treatment the hæmaturia disappeared, the dysuria was relieved, and the general condition improved. After three months of treatment the mucosa was normal.

Valverde bases his diagnosis on the cystoscopic appearance and the results of treatment.

Among the fifty-seven cases of syphilis of the bladder seen by Valverde, thirty-five presented a constant lesion leading to the diagnosis of ulceration of the mucosa. In thirty of the thirty-five cases the ulceration was a single deeply excavated lesion with an irregular border, the base of which was a dark red, the color of the completely formed hard chancre. In cases of such lesions the diagnosis is aided by the sharp contrast between the deep color of the ulceration and the congestive circle surrounding it and the rest of the cystoscopic field which generally has the appearance of normal mucosa. In some cases there is intense congestion of the mucosa with generalized and profuse vascularization, secondary exanthem, and vegetations, but these changes are rare and are preceded by symptoms suggesting acute activity of the disease.

The diagnosis is aided also by the location of the lesion. In thirty-three of the thirty-five cases reviewed the lesion occurred on the lower wall of the bladder. Other factors of diagnostic aid are the markings in relief on the mucosa, the vegetations, mosaic effects, false diphtheroid membranes, and cerebriform appearances.

In the treatment the author uses injections of mercury, bismuth, and iodine. He prefers colloidal forms of mercury and bismuth. PACE

Godard, H., and Koliopoulos, A. Total Cystectomy for Cancer of the Bladder in Women (La cystectomie totale chez la femme dans le cancer de la vessie). *Rev. de chir*, Par., 1932, li, 201.

The authors perform total cystectomy under spinal anæsthesia following preliminary bilateral ureterostomy. The entire block of tissue containing the bladder, uterus, and adnexa and the vesicovaginal zone corresponding to the trigone are removed *in toto*. The lymph glands are carefully dissected out as in cancer of the uterus.

This operation is indicated in cancers of the fundus trigone, and lateral walls of the bladder.



destruction from high-grade blocking of the outlet, but the removal of the stones will substantially relieve the difficulty. In some of these at least temporary nephrostomy may be desirable. Another group includes cases of bilateral stone formation of the type in which treatment by removal of the stones is not satisfactory. In a considerable number of these cases massive stone formation occurs on both sides with relatively few symptoms, but after a time leads to progressive failure of renal function which will prove fatal if it is not relieved.

4. *Carcinoma of the bladder* In cases of this condition thought suitable for total cystectomy nephrostomy may occasionally be indicated to divert the urinary stream.

5. *Progressive atrophy of the kidneys resulting from the failure of the muscular apparatus of the pelvis, ureters, and bladder to evacuate the urine satisfactorily*

6. *Renal infection from high-grade obstruction.* In this condition nephrostomy is done to prevent recurrent infection of the kidney and allow some amount of renal recovery.

Permanent nephrostomy should probably be reserved for cases in which the condition for which the nephrostomy is done cannot be remedied or at least cannot be remedied to a permanently satisfactory extent. In a few cases a temporary nephrostomy must be made permanent on account of the failure of methods to relieve the obstruction. The duration of temporary nephrostomy will vary with the conditions for which it is done.

In the presence of distention of the renal pelvis, and particularly when the structure has been opened for the removal of calculi, drainage of the renal pelvis has been regarded as the indicated procedure. However it is open to objections. The operation has been regarded as desirable because it does not injure renal tissue, does not expose to the same danger of fulminating renal infection that may occur in an infected kidney, and is in all respects a much less serious procedure than pyelostomy. It may be done by methods which make it a quite trivial procedure. Pyelostomy has a much more limited scope than nephrostomy and one which will tend to become even more limited in the future.

During the last year nephrostomy has been performed at the Mayo Clinic in thirty three cases. The conditions for which it was done were nephroblastosis, hydrocephrosis, lesions of the nerves, obstruction of the lower part of the ureter, renal infection, and carcinoma of the bladder. Three of the patients died as the result of the operation. There was no postoperative bleeding and no fulminating renal infection.

The method suggested by Cabot and Holland is as follows:

The kidney having been exposed and mobilized to gain access to the upper part of the ureter and the renal pelvis, a small opening is made in the renal pelvis or in cases of intrarenal pelvis, in the ureter. A uricase sound with a slightly bulbous tip bent in a "U" shape is introduced into this opening and passed

out through the cortex at a point where it will draw the kidney by draining the lower calyx and will not be subjected to angulation as the kidney falls back into its normal position. A piece of stout silk is then attached to the bulbous tip of the sound and is drawn through the kidney and out of the opening in the pelvis. To this silk is attached a No. 20 to 24 French winged catheter. The end of the catheter is trimmed off to a point. By traction on the outer catheter is then drawn accurately along the line created by the sound. It fits so tightly in the renal parenchyma that bleeding is entirely controlled. The small opening made in the renal pelvis is allowed to remain open until spontaneous closure takes place, which usually occurs within a week. The winged catheter is not fastened to the kidney or to any portion of the overlying tissues, the kidney being therefore allowed to lie in whatever position it falls. The catheter is left in place for about two weeks. At the end of that time it may be replaced by a straight tube. The removal of the catheter is facilitated by passing through it a silkette. Traction on the catheter will then smooth out the wings so that the catheter will not lacerate the renal tissue. If the straight tube is immediately replaced and if care is taken to see that it penetrates exactly the same distance, most satisfactory drainage is obtained.

Alenworth Davis, J. C.: *Ureterocoele Some Observations Based on the Investigation and Treatment of Four Cases.* *Brit J Surg* 1924, 21: 511

The author reports four cases of ureterocoele and classifies them as mucous and prostatic. The symptoms include those of the upper urinary tract—renal or ureteral pain and hematuria—and those of the lower urinary tract—vesical irritation and obstruction of the urethra. The diagnosis is dependent upon cystoscopic examination.

Ureterocoele may be due to a placoid arterial orifice, and the latter may be congenital or acquired, unilateral or bilateral. Ureterocoele must be treated surgically by diathermy or open operation. Open operation is recommended for cases with complications.

DOUGLAS E. HINES, M.D.

Fowler, H. A.: *A Solitary Papilloma of the Lower Ureter (Right) Secondary to Mucocystic Carcinoma of the Bladder.* *J. Urol.*, 1931, 23: 61.

From a review of the literature it is apparent that the association of tumor of the bladder and of the ureter is very rare. Tumors of the ureter are relatively rare. They may be classified according to their histological structure as (1) sarcomata, (2) mixed tumors, (3) papillomata, (4) papillary carcinomata, and (5) non-papillary carcinomata (a) squamous-celled and (b) medullary or solid.

They may be further classified into primary and secondary benign and malignant, pedunculated and sessile. Secondary tumors of the ureter are far more common than primary tumors. They are formed chiefly by the extension into the ureter of papillary growths of the renal pelvis and occasionally by the

patient is comfortable unless bleeding occurs, when the buttocks should be elevated

The author states that he has never regretted an early operation, and has removed small adenomata with good results

ANDREW McNALLY, M.D.

**Lorenzini, J** The Testicular Hormone (L'hormone testiculaire) *Presse méd*, Par, 1932, xl, 476

Although the entire doctrine of endocrinology began with the studies of Berthold and Brown-Séquard on testicular grafts and extracts, little progress was made toward isolating the male hormone until very recently. Previous lack of progress was due to the fact that only a minute portion of the gland is devoted to the internal secretion, extraction being therefore very difficult, and to the lack of a reliable biological test to establish the presence of the hormone. The recent work of Pezard has made available a test which is specific and gives a fairly accurate indication of the potency of any preparation. A castrated rooster with an undeveloped or atrophied comb and wattles is given daily injections of the extract. The quantity which will cause the comb to grow 1 cm. has been accepted as the "rooster unit."

The first systematic studies of methods of extraction of the hormone were made by Funk, Harrow, and Lejwa. In the blood and urine these investigators demonstrated an active substance which had certain chemical resemblances to the female hormone. Their product was an oily chloroform extract. By distillation under low pressure, Dodds, Greenwood, Allan, and Gallimore obtained an oily substance containing crystals. However, the latter were not described or identified.

Fratini and Maino, working in the author's laboratory, were the first to isolate the male hormone in a crystalline form (*Archivio dell'Istituto biochimico italiano*, 1930 December). Testicles of bulls were extracted by a method similar to that employed for isolation of the female hormone. The originality of the method consisted in the almost entire elimination of lipid solvents. The crystallized hormone was obtained by evaporation of the final ether extract.

The male hormone is only slightly soluble in neutral or acid water and very soluble in alkaline water, strong alcohols, benzene, acetone, toluol, chloroform and ether. It is precipitated by neutral salts, salts of heavy metals, tannic acid, and benzoic acid, and is very resistant to the action of acids, alkalis, reducing agents, and high temperatures. It contains no nitrogen.

According to Butenandt, the hormone is a ketone having the formula  $C_{16}H_{26}O_2$ .

Theories regarding the action of the sex hormones have undergone much change. It is now well established that the activity of the testis and ovary is controlled by a hormone produced by the anterior lobe of the hypophysis. The sex hormones control the development and function of the accessory genital organs and the development of the secondary sex characteristics. The supposed antagonistic action of the ovarian and testicular hormones has been dis-

proved. These hormones can act simultaneously. Moreover, they have certain physiological properties in common. For example, the male hormone produces rut in castrated or prepubescent females and folliculin brings on puberty in young males. This fact invalidates all biological tests based on hypertrophy of the genital tract and explains the demonstration by certain investigators of the female hormone in the testes and the urine of males. On the secondary sex characteristics, however, the male and female hormones have strictly specific effects.

ALBERT F. DE GPOAT, M.D.

**Retterer, E** The Structure of Two Testicular Grafts After Survival of Six Years (Structure de deux greffons testiculaires après une survie de six ans) *Ann d'anat path*, 1932, ix, 233

The author reports a case in which the implantation of grafts from chimpanzee testicles was done twice. At the time of the first operation the patient was sixty-five years old. He gave a history of gonorrhoea followed by orchitis on the right side at the age of eighteen years and of pleurisy at the age of forty-two years. He had worked as a business man from the age of twenty and was very vigorous until the age of sixty, when he began to notice great weakness. On seeking treatment he complained of stiffness in the back and limbs, increasing difficulty in walking, somnolence after meals or after an hour of reading, fatigue after an hour or two of work in his office, lapses of memory, periods of discouragement and sadness, and a lack of will power. The genital functions were normal until the age of fifty-eight years, but then began gradually to weaken. During the last few years they had ceased entirely.

At operation, four grafts of chimpanzee testicles were implanted, two on each testicle. Three months later the patient's physical strength began to increase. Walking was easy, his memory was restored to a surprising degree, and he was again able to work from six to eight hours in his office. Six months after the operation the genital functions returned. These results lasted almost six years. At the end of that time the patient began again to experience fatigue in walking. Fearing that this indicated loss of the considerable benefit he had derived from the grafting, he demanded another operation.

At the second operation, one of the two grafts implanted on each testicle six years previously was found to persist. Voronoff ablated these two grafts and implanted two new chimpanzee grafts.

The two grafts removed were ovoid and 2.5 cm long. In the middle portion they were 1 cm thick. In width, the left one measured 1.5 cm, and the right one 1.3 cm. Therefore these grafts had retained the dimensions of the two strips taken from the testicle of the chimpanzee. They were very easily detached from the sheath. On transverse or longitudinal section each showed a central mass which was soft and consisted of a straw-colored pulp surrounded by a thick, grayish-white cortex from 0.1 to 1 mm thick.

Partial cystectomy is warranted only in cases of early tumor or tumor of the dome of the bladder. While total cystectomy has a high mortality the authors believe that it offers better chances for palliation than radium irradiation or electrocoagulation, and that the latter should be reserved for entirely inoperable growths. *GEORGE DE TARANT, M.D.*

**Keyes, E. L.:** Forty Years' Experience in Operating upon the Bladder Neck. *South. M. J.* 93: 335.

Keyes reviews surgery of the neck of the bladder from the standpoint of his father's and his own experience in the period from 1890 to 1930.

He states that suprapubic prostatectomy was originated by Fuller and Freyer. Perineal excision of the prostate was devised by Gouley and a little later by Alexander. Prostatectomy had a mortality of over 30 per cent until surgeons learned how to apply preliminary decompression and recognized the danger of infection from the retained catheter and from suprapubic cystotomy.

Keyes believes that not uncommonly there is a sclerosis of the prostate distinct from sclerosis of the neck of the bladder. For sclerosis of the neck of the bladder he prefers suprapubic resection with a rongeur. He uses this method in cases in which the Caulk or Young punch has failed. The rongeur operation is more effective than transurethral procedures because it removes much more tissue than any of the latter except possibly the transurethral electrocoagulation of Davis or McCarthy.

*ARMOUR McNALL, M.D.*

### GENITAL ORGANS

**McCarthy J. F.:** The Prostate at the Crossroad. *Am. J. Surg.* 93: 27-435.

McCarthy gives a brief review of the development of the instruments used for endo-urethral removal of prostatic tissue. The essential elements of the modern resectoscope were assembled by Stern, and the feasibility of endo-urethral removal of prostatic tissue under proper conditions was demonstrated by Davis. The requirements for the operation are:

1. The most exact visualization of the prostatic urethra.
2. The greatest possible flexibility of manipulation, under vision, of the electrical cutting loop.
3. Ample electrical power to excise the obstructing prostate under water with minimal hemorrhage and tissue coagulation.
4. Interchangeability and ease of manipulation of electrodes in the course of bleeding points.
5. Completion of the operation, including the introduction of a No. 24 French whistle-tip indwelling catheter with only one introduction of the instrument, the sheath being withdrawn after the catheter has been passed through it.

To meet these requirements the author advocates the use of his panendoscope with suitable sheaths

and electrodes and adequate electrical power which was developed by Wappler.

When given by an experienced urologist, the treatment described is adequate for prostatic fibrosis and for relief in cases of prostatic carcinoma. However, pre-operative and postoperative care is essential for a successful result.

Bleeding is controlled under vision before removal of the instrument. A special type of bag for hemostasis has been perfected for use in cases of persistent oozing.

As much prostatic tissue as is desired may be removed. According to the author's experience, repetition of the procedure is seldom necessary.

*ARMOUR McNALL, M.D.*

**Thompson, A. R.:** Some Points in Connection with the Successful Issue of Simple Prostatectomy. *Proc. Roy. Soc. Med. Lond.*, 1933, 27: 901.

In cases in which the author contemplates performing a prostatectomy the patient is taught thoracic respiration by a nurse before the operation. The usual functional tests are carried out and the patient is allowed to become accustomed to his surroundings. Thompson believes there should be no hesitancy in using the catheter provided proper precautions for asepsis are taken. Since 1926, incision of the bladder following the use of the catheter has occurred only in one of his cases. Catheterization may reveal local conditions of the glands. Thompson avoids the pre-operative administration of atropin as it may produce flaccid.

At operation, the bladder is filled with a mild antiseptic solution until it rises just above the pubis. The peritoneal spaces are packed off and the bladder is opened transversely. The bladder is inspected and any complicating lesions such as a diverticulum or stone is cared for. The adenoma is removed and hemostasis is obtained by means of sutures or a pack. If no bleeding occurs the bladder is allowed to fall back to its normal position. The prostatic cavity is drained by a glass tube with an oblique flange. Rubber is not used. The ureters are placed through fascia and skin with a avoidance of the rectum. In order to prevent local oedema no sutures are used in the lower part of the skin wound. The penis and scrotum are strapped high on the abdomen and the dressings then applied. One cubic centimeter of pituitrin is given routinely.

After the operation the dressings are not changed for twenty-four hours. A urethral catheter is not used. When a persistent fistula is present, a search is made for bladder mucosa deep in the wound and such mucosa is removed. The drainage tube is removed when the urine and washings become clear. In cases of sloughing suprapubic wounds the wound is filled with boric acid crystals. A temporary is fitted as soon as the patient gets up.

The outlook in cases of prostatectomy complicated by stone is not especially favorable. Diabetes is not a contra-indication to operation. The position after operation may be any one in which the

# SURGERY OF THE BONES, JOINTS, MUSCLES, TENDONS

## CONDITIONS OF THE BONES, JOINTS, MUSCLES, TENDONS, ETC

Ravina, A., and Loisel, G. Subcutaneous Calcareous Concretions (Les concrétions calcaires sous-cutanées) *Presse méd.*, Par., 1932, **XL**, 714

The subcutaneous deposits of calcium salts discussed by the authors were first described by Fallopius and Paré. Interest in them has been renewed since Milian advanced the theory that they are of parasitic origin and Thirbierge and Weissenbach investigated the concretions associated with scleroderma. Recently they have been studied from the standpoint of calcium metabolism.

The calcareous concretions are of two main types: (1) isolated concretions with a granulomatous structure, and (2) concretions associated with other disturbances, notably scleroderma.

The disease begins insidiously. It is most common between the ages of seven and sixteen years, but has been found also in the second and sixtieth years of age. It is relatively frequent in females at puberty and the menopause.

The first sign is usually a single mass appearing in the vicinity of a joint or serous bursa, generally on a finger or the anterolateral surface of the leg. Less frequently it is near the prepatellar bursa, on the external surface of the elbow, or in the scrotum. The mass is at first soft and fluctuating and may suggest a cold abscess. If it is opened at this stage a creamy exudate containing gritty particles is found. For a long time the overlying skin remains unchanged. In the course of months or years new nodules are formed. When the disease has become established there are multiple painless stony masses adherent to the skin but freely movable over the deep tissues. These vary in size from that of a pinhead to that of a walnut. Eventually the skin may ulcerate with resulting fistulization or elimination of the concretions. There are general signs of decalcification. One of the most common is loss of teeth. Masses about joints may produce ankylosis and muscular atrophy. Ichthyosis, nevi, and pigmentations are common. The terminal phase is characterized by cachexia, intestinal ulceration, and diarrhoea.

Isolated concretions begin as nodules formed by a collection of lymphocytes and Langhans giant cells. The center liquefies and there is formed a fibrous capsule which for a long time shows inflammatory cells. The contents of the resulting cyst, at first gritty, become at length entirely calcified. The capsule evolves toward an acellular fibrous tissue. The same description often applies to the nodules associated with scleroderma, but in the latter condition the calcification more commonly

follows hyaline degeneration without an intervening inflammatory stage.

Weissenbach has produced identical calcareous concretions in guinea pigs by subcutaneous injections of oil containing calcium phosphate and carbonate. His results show that the calcium salts act in the cellular tissues as foreign bodies and also, to a variable degree, by chemical irritation.

On chemical study of the blood in the condition under discussion the calcium level is found to be normal, but the phosphates are often increased to four times the normal. The uric acid and cholesterol are also markedly increased as a rule, but these substances do not enter into the composition of the concretions. There is often a certain degree of alkalosis.

The Wassermann reaction is always negative. No organisms have been cultured from the lesions.

Most of the patients exhibit endocrine disturbances, usually ovarian or thyroid. Recently the origin of the disease has been sought in a parathyroid adenoma and metastatic calcification.

In the only case in which the calcium balance has been completely investigated (Bauer, Bennett, and Marble), a progressive retention of calcium was found.

ALBERT F. DE GROAT, M.D.

Abbott, A. C., and Goodwin, A. M. Observations on Bone Formation in the Abdominal Wall Following Transplantation of the Mucous Membrane of the Urinary Bladder. *Canadian M. Ass. J.*, 1932, **XXVI**, 393.

The authors report a case of bone formation in the abdominal wall following a two-stage prostatectomy. Eleven days after the second stage of the operation the patient complained of a small mass in the lower end of the incision. This increased in size until at the end of seven months the roentgenogram showed a triangular area of bone extending from the symphysis pubis by a broad base upward to just below the umbilicus. It was apparently in the rectus muscle and attached to the symphysis.

Huggins' observation following the transplantation of mucous membrane of the bladder into the various layers of the abdominal wall are cited. Invariably this transplantation produced true bone formation. The results were most definite when the transplants were placed between fascial layers. The formation of bone occurred in a characteristic manner. An epithelium-lined cyst appeared first, and about twenty days later spicules of bone were seen adjacent to the newly formed mucosa of the cyst.

The authors report experiments on eighteen dogs in which bladder mucosa and full-thickness transplants were buried in the abdominal wall. Cysts with bone formation were found in most of the

The grafts were not invaded by connective tissue or migratory cells from the host, but were greatly changed in their structure. Their peripheral or cortical portion, which was in contact with the sheath, was transformed into connective tissue, a change probably explained by the abundant supply of nutritive plasma furnished by the sheath of the host. The epithelium of the tubes or seminal cords, which was in a well-nourished region, not only survived but also underwent a progressive evolution, being transformed into a dense connective tissue enveloping the whole graft.

In the central portions of the graft the cytoplasm and the nuclei, which were less well nourished, especially after the development of the dense connective shell, had retrogressed. They had degenerated into a fatty mass.

As long as the epithelial cells persisted they made exchanges with the blood of the host and poured stimulating principles into it, but after they were transformed into connective elements or degenerated into fat, the grafts were inert bodies from the point of view of internal secretion.

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#### MISCELLANEOUS

Darjet, Demade, and Boileau: Cases of Urinary Mycosis (*Quelques cas de mycose urinaire*)  
*Ann. Méd. et Chir.* 1931, XXXII, 64.

Three cases of mycosis of the urinary tract are reported in detail. On the occurrence of intestinal disturbances with the passage of glairy stools in these cases, Boileau examined the stools and found sporulated elements and short mycelial elements resembling those discovered in the renal urine. The same elements were present also in the gingival secretion obtained from the region of several carious teeth.

The urinary manifestations which dominated the clinical syndrome were signs of severe cystitis with painful spasms radiating to the anal sphincter which resisted all treatment. The cystitis was as severe as that caused by advanced urinary tuberculosis or neoplasm. The urine was very bloody and contained an amount of pus out of proportion to that of simple cystitis. Every day a large amount of thick and sanguinolent glairy material was passed. In Case 1 the renal manifestations were limited to several attacks of pyelonephritis with the appearance of short mycelial filaments in the urine and operation revealed a slight inflammatory reaction of the kidney. In experiments on guinea pigs, the predominant localization of the lesions was the same.

Involvement of the prostate was found in these cases and perhaps favored the predominantly vesical localization of the lesions by interfering with the evacuation of the bladder.

In the first case the presence of bacilli and of mycelial filaments in the stools suggested that the patient had been inoculated through the digestive tract. As Boileau found only short intraleukocytic mycelial filaments in the renal urine, the authors believe that these pathogenic elements traveled the kidney by the blood or lymphatic route without causing serious damage and developed in the bladder because of the physiological stagnation of the urine.

All of the urinary antiseptics used internally or hypodermically and all local treatments were without effect. Iodides given internally in doses of from 6 to 7 gm. seemed useless. The intravenous administration of Lugol's solution advocated by Auzan for splenic mycoses was not employed. Prostating radiotherapy had a calming effect of only short duration. The only treatment that seemed of any value was the intravenous administration of a 1 per cent solution of mercurochrome.

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The authors report experiments on eighteen dogs in which bladder mucosa and full-thickness transplants were buried in the abdominal wall. Cysts with bone formation were found in most of the

animals. However, the newly formed bone was strictly limited to the newly formed epithelium and never infiltrated the surrounding tissue.

ROBERT C. LOEWEN M.D.

Wilson, E. H., Down, C. A., and Miller D. F.: The Bee Maggot Treatment of Osteomyelitis. *J. Am. Med. Ass.*, 93, xcviii, 1149.

The authors report a study of the Bee maggot treatment in twenty-six unselected cases of osteomyelitis. The investigation was carried out co-operatively by the Department of Zoology and Entomology, the Departments of Medical and Surgical Research, and the Department of Clinical Orthopedic Surgery of the Ohio State University. Therefore it was possible to make a complete series of studies beginning with the rearing of the flies and ending with the treatment of patients in the hospital.

Nine of the twenty-six patients were adults. In twenty-two cases healing without a sinus occurred. These included five cases of involvement of the femur, twelve cases of involvement of the tibia, two cases of involvement of the radius, and one case each of involvement of the ulna, humerus, and a metatarsal bone. In some of them the condition was of long standing. In children, uneventful healing occurred in an average time of nine weeks.

In two of the four cases in which healing was not obtained the patients were not under observation for a sufficient period of time. In the two others the treatment failed.

Baer's technique was carefully followed, with surgical preparation of the wound prior to implantation of the maggots. Early cases demonstrated the importance of experience in the use of the method. It was found, for instance, that too immature larvae failed to survive. Cultures seventy-two hours old are best, although the age becomes less important after several implantations in a given case. The larvae will not live in the presence of acid secretions; therefore irrigation of the wounds with mildly alkaline Sells's solution before the implantation was found of aid. When a large amount of necrotic material is present large numbers of larvae are needed. Free drainage must be secured as otherwise the maggots will be drowned.

The authors were impressed with the rapid improvement in the appearance of the wounds.

The scar remaining is a distinct improvement over the scar left by other treatment as the cavity formed by the operation and the disease process is obliterated by the ingrowth of healthy granulation tissue with at least partial restoration of the blood supply.

ROBERT C. LOEWEN M.D.

Pétrigault, R.: Traumatic Periarthritis (Les périarthrites traumatiques). *Rev. Chir.* 93, xxxi, 1.

Nine cases of traumatic periarthritis of the knee joint are reported with roentgenograms. The knee is the joint affected most frequently but the condi-

tion may occur in any joint. It is more common than it was believed to be before the use of the roentgen rays. A definite diagnosis can be made only by means of roentgenograms. The condition is also called the *Sicula Pellegrini* syndrome from the names of the persons first describing it.

There is no injury of the bone or joint, only the surrounding soft parts and ligaments are traumatized. As the capsule and ligaments are rich in sympathetic terminals, the condition is a neuro-traumatism. The injury reacts on the central nervous system, bringing about permanent active vasodilatation. The contusion causes a hematoma, and the hematoma is the fundamental lesion of beginning periarthritis. The hyperemia results in decalcification of the bones. As a rule the osteophyte remains limited to the immediate region of the injury but in some cases it may extend to the whole epiphysis. It never involves the diaphysis. The calcium is transferred to the soft parts and causes a periarthritic ossification. The author prefers to call the condition an "ossification" rather than an "osteoma" as there is no true bone tumor. The decalcification of the bone and ossification of the soft parts produce the characteristic roentgen picture.

The amyotrophy, limitation of movement, and pain are present in arthritis as well as periarthritis. Palpation of a hard mass adjacent to the bone is significant, and the diagnosis may be confirmed by roentgen-ray examination. Arthritis and periarthritis are often associated.

The most important treatment is prophylactic treatment of the injury. As a rule such injuries are bandaged and then massaged and the patient is allowed to go back to work. Massage is injurious instead of beneficial as it tends to cause ossification. Early mobilization is also dangerous. Absolute and prolonged immobilization is indicated in any injury near a joint. Firm pressure with elastic bandages should also be used for the first few days to prevent edema. The compression need not be continued long unless there is swelling. It may be replaced by hot air or ice for the hyperemia. The more serious the injury the more prolonged the immobilization should be. In serious cases Lerche recommends the use of plaster for as long a period as for fracture. He recommends also evacuation of the hematomata if they are very large. The flesh should not be used until all signs of inflammation have disappeared. Electrotherapy should be used for the para-articular muscles. The treatment requires several weeks. As the insurance companies are apt to object to this, Lerche proposes blocking the short sympathetic reflexes starting from the joint by periarthritic intraligamentous injections of an anesthetic. The patient should never be allowed to go back to work without a roentgen ray examination. This may show normal conditions, ossification, or simple opacity around the joint. The author believes that in the presence of the latter findings roentgen therapy is beneficial.

After peri-arthritis has developed, Pétrignani has obtained good results from alternate treatments with diathermy and irradiation with infra-red rays. Roentgen therapy is also beneficial. It may arrest the progress of the ossification. Surgical removal of the osteoma has proved successful in about 70 per cent of the cases in which it has been used. It should not be practiced until the ossification has become stabilized.

The article is supplemented by an extensive bibliography.

AUDREY GOSS MORGAN, M.D.

Ray, M. B. Osteo-Arthritis. *Brit. M. J.*, 1932, 1, 789.

To obtain a working classification of the various forms of chronic arthritis the author suggests that all joint diseases be divided into two main groups: (1) specific conditions, in which the cause is known, and (2) non-specific or rheumatic conditions, in which the cause is unknown. To the first group belong conditions due to trauma or associated with the presence of a known infective agent such as the tubercle bacillus, the gonococcus, the spirochæte, the pneumococcus, or the typhoid bacillus. Conditions in the second group may be divided into two subgroups, those in which the joint surfaces are involved primarily (end-articular conditions) and those in which the tissues around the joint are involved primarily (peri-articular conditions). As the terminology applied to the first subgroup is anatomical it is more exact than that applied to the conditions of the second subgroup. The latter have been designated by such terms as "rheumatoid arthritis," "infective peri-arthritis," "atrophic arthritis," and "focal arthritis." Occasionally both varieties are called "arthritis deformans," but this term is falling into disuse. The confusion in the nomenclature is due to lack of agreement regarding the basis of classification, some observers viewing the conditions from the anatomical standpoint and others viewing them from the etiological point of view. It is only in the earlier stages of these diseases that definite distinctions can be made because in the later stages of the second variety changes characteristic of osteo-arthritis may be superimposed.

The changes in osteo-arthritis can be considered best as they affect (1) the articular cartilage (2) the underlying bone, and (3) the synovial membrane and capsule.

Osteo-arthritis unlike rheumatoid arthritis is much more a local than a general condition. Its victims are usually well-nourished robust persons of a plethoric type. The two most important factors in the etiology of the condition are advanced age and trauma. Osteo-arthritis is essentially a disease of later middle life, when early degenerative changes begin. According to Glover the typical age of onset of monarticular osteo-arthritis is at least two decades later than that of rheumatoid arthritis. In men, the hip and spine are most often affected and in women the knee is involved most frequently.

The association of the joint condition with a focus of infection is not nearly so apparent in osteo-

arthritis as in rheumatoid arthritis. As Glover points out, 75 per cent of the population over the age of forty years have septic teeth, yet, the percentage over that age who are suffering from arthritis is much lower. Dampness of houses is more likely to bring on fibrositis than arthritis.

Following a general clinical description of osteo-arthritis the author discusses the individual joints most commonly involved.

As the finger joints are involved in practically every type of arthritis, the ability to distinguish the various changes is most important. Outgrowths from the epiphyseal ends of the phalanges are extremely common in elderly persons, especially women. Heberden's nodes besides being unsightly, may be tender and painful when they first appear. They can be distinguished from the tophi of gout by the fact that they are firmly attached to the bone, whereas the gouty nodule is capable of slight movement.

Arthritis of the wrist especially when there is considerable synovial effusion is more likely to be of the infective or rheumatoid type than of the osteo-articular type. The possibility of a gonococcal infection in this condition should not be overlooked.

Blacksmiths are prone to develop osteo-arthritis of the elbow from the welding of their heavy hammers. The condition is characterized by pain on movement, stiffness, creaking and liability of the joint to lock in certain positions. It is not a common affection.

In advanced cases of osteo-arthritis a ring or collar of osteophytes may be found surrounding the head of the bone. This will seriously interfere with the normal movement of a joint.

Spondylitis is divided by Buckley into two main types—spondylitis ankylopoietica or ankylosing spondylitis and spondylitis osteo-arthritica. The important causative factor in the latter appears to be heavy labor. The primary change probably occurs in the intervertebral disks which undergo changes similar to those occurring in the cartilaginous surfaces of other joints. Exostoses are thrown out to support the weakened joints. These can be seen in roentgenograms and are in striking contrast to the bamboo-like appearance of the ankylosing variety. Some degree of movement is always retained but the lumbar curve may be flattened and a kyphosis may be present in the dorsal region. If the osteophytes press on nerve roots there may be very severe pain. As a rule the pain is severe only after strain and is then relieved by rest for a few days.

Coxarthrosis or *malum coxae senilis* is much more common in men than in women. It is essentially a disease of late middle life or old age. The earliest symptoms are usually neuralgic. There is pain along the distribution of the sciatic nerve and it is extremely difficult at first to determine whether the condition is incipient coxarthrosis or sciatica.

In the knee joint osteo-arthritic changes are common. As the strength of this joint is due, not to the



anatomical peculiarities of the articular ends of the bone, but to the toughness and resistance of the complex structures which bind the bone ends together strains and relaxations of the muscles and ligaments readily bring about faulty apposition of the bony components of the joint. Osteo-arthritis of the knee may occur in both sexes, but is most common in women at about the age of the menopause. In their work on fibrositis, Llewellyn and Jones refer to two stages in the history of this condition as it occurs in women: (1) a primary or pre-osteophytic stage often of prolonged duration, which has the clinical characteristics of villous hypertrophy and (2) a secondary or terminal stage in which bony and cartilaginous outgrowths appear. By some, the condition is called "climacteric arthritis," but its end-results are osteoarthritic.

In the foot the most common form of osteo-arthritis is found in association with the weak or flat-foot in which the longitudinal arch has fallen and compensatory proliferation has taken place in the astragulus, the latter showing a distinct bulging above the inner plantar margin. The metatarsophalangeal joint of the great toe also commonly presents osteo-arthritis changes. The condition known as painful great toe is often due to hypertrophic outgrowths corresponding to Heberden's nodes in the fingers.

Although in many respects osteo-arthritis may be looked upon as a local rather than a general disease, its manifestations are associated with degenerative conditions. Therefore the treatment must be directed toward preventing unnecessary metabolic burdens. It is a good working rule to estimate the caloric value of the ordinary diet of the patient and reduce it by one-third. This rule is applicable especially in the case of well-nourished plethoric persons. The blood pressure and the uric acid content of the blood are usually high. Therefore the diet should be similar to that prescribed for gouty patients. As osteo-arthritis is undoubtedly associated with the absorption of toxins from a sluggish bow, foods rich in purine should be avoided and an adequate supply of vitamins should be assured. The use of Bulgarian sour milk or a preparation such as lactodextrin to change the character of the intestinal flora often gives good results.

In addition to general measures there are certain physical methods which may prove of value in restoring movement to stiffened joints and muscles and relieve pain.

As joints cannot be healthy unless they are functionally active, the question arises as to whether osteo-arthritis joints should be kept moving. When the pain is intolerable and neither physical methods nor fixation will relieve it, operative intervention must be considered.

FRANK LEWIS, M.D.

King, D. H.: Syphilitic Arthritis with Effusion. *J. M. Soc.*, 1931, *clxxxiii*, 338.

In the diagnosis of syphilitic arthritis it is necessary first to establish the presence of syphilis. In seven of

the cases reviewed by the author the presence of syphilis was established by the Wassermann reaction, in one, by hectic paracymbates test, and in one, by joint-articular gummas. The real task in the diagnosis is to prove that the joint lesion is due to the syphilis. This is more difficult. A complete examination of the joint is necessary to rule out other conditions. The most important evidence that syphilis is responsible for the arthritis is a positive Wassermann reaction in the joint fluid associated with negative other findings. The discrepancy between a history of trauma and the inflammatory character of a joint effusion in a syphilitic patient is suggestive. The age of the patient furnishes a clue, as syphilitic arthritis is most frequent in children and young adults. The clinical picture of a monoarthritis or bilateral involvement of the knee joints with only slight pain, much swelling, and pericardial thickening and the absence of systemic manifestations is also important. Roentgen-ray evidence is available only when pathological changes have occurred at the articular surface, as in two of the author's cases.

Therapeutic evidence consists of inefficiency of non-specific therapy and a characteristic response to specific therapy. The latter consists of the absence of an evident change or exacerbation of the type of the Herxheimer reaction after initial doses and successful results from the full course of treatment in cases in which destruction of the joint is not too far advanced.

Accurate diagnosis and successful treatment restore the joint structure and help to eradicate the disease.

FRANK LEWIS, M.D.

Simon, M., and Walli, J.: Operations on the Parathyroid Region in Arthritis Deformans (Opérations sur le région des parathyroïdes et rhumatisme déformant). *Presse méd. Par.* 33, 2, 43.

The first to treat arthritis deformans successfully by parathyroidectomy was Opel of Petropoli. Leriche introduced the operation into France and obtained good results from it in a number of cases. Opel and Leriche based the indications for the operation on the finding of hypercalcaemia, but in studying the histories of their cases the authors were surprised to discover that good results were obtained in some cases in which histological examination showed that only typical thyroid tissue or a fragment of fat and no parathyroid tissue had been removed.

The authors therefore decided to try the effect of simply incising the tissues of the neck down to the parathyroids under local anesthesia and closing the wound. They report two cases of very severe arthritis in which very great improvement was brought about by this procedure. They question the correctness of the theory of Opel and Leriche that the operation should be based on hypercalcaemia as in one of their cases the blood calcium was normal and in the other it was subnormal. In the case with hypocalcaemia there was also a hypopar-

thyroidism which was sufficiently advanced to cause latent tetany. In this case a true parathyroidectomy would doubtless have been injurious. The false parathyroidectomy gives excellent results without depriving the patient of an essential gland.

AUDREY GOSS MORGAN, M.D.

**Marinesco, G., and Allende, G.** Chronic Infantile and Familial Rheumatism (Rhumatisme chronique familial et infantile) *Presse méd.*, Par., 1932, xl, 646

This article reports a study of a chronic progressive type of polyarticular rheumatism occurring in three children six and a half, five, and three and a half years of age respectively who belonged to the same family. A fourth child was free from the disease. There was no history of rheumatism in the family. All laboratory tests, including the Wassermann test and Pirquet's skin test, were negative. The first symptoms were noted at about the tenth month of life.

The authors emphasize that this rare condition has nothing in common with Still's disease, which appears later in childhood and is characterized by adenopathy, splenomegaly, elevation of the temperature, and digestive disorders. They believe that the streptococcus viridans may be responsible for the lesions in and around the joints although a constitutional factor seems very important.

GEZA DE TAKATS, M.D.

**King, E. S. J.** The Pathology of Ganglion. *Australian & New Zealand J. Surg.*, 1932, 1, 367

King reviews the history and pathology of ganglia, calling attention to the fact that ganglia were known to Hippocrates. The swellings are seen on the hands and feet and about the knee joint. They occur in the region of the joint capsules and tendon sheaths. Ordinarily they do not communicate with the adjacent cavity. They are three times as frequent in females as in males, and are comparatively rare after the fourth decade of life.

The microscopic findings show that the development of ganglia may be divided into three fairly definite stages. The first stage is characterized by a large number of spheroidal cells which are closely packed together and merge by insensible gradations into spindle cells at the periphery. The second stage may possess features of the first stage and present a central area which is beginning to take on the characteristics of a cavity filled partly with a secretion from these cells. Sometimes all of the spheroidal cells undergo the mucoid change at the same time so that the mucoid material abuts on the spindle-cell tissue. It is in the third stage that one finds the changes seen in the well-developed ganglion. In this stage the wall is smooth and of variable thickness and the lining membrane bears an astonishing resemblance to the synovial membrane of joints.

Attention is called to the close morphological similarity between the hyperplastic synovial mem-

brane and the lining of the ganglion. After subsidence of the active process, which is the result of stimulation of the cells, the cells revert to their original condition and the majority of them become spindle-shaped, the cyst wall resembling the structure from which the cells arose.

The small cysts may communicate with one another, but there is no evidence of a true papillary growth to indicate that they are neoplastic and no evidence that the condition is of the ordinary inflammatory type. King therefore believes that the process may be regarded as a proliferation of cellular structure, a disintegration of cells and an accumulation of cellular secretion with the formation of a cavity. He concludes that the process is not primarily a degeneration of cellular tissue, but a secretion of the synovial cells. He believes that the chief causes are trauma and a constitutional factor.

PATL C. COLONNA, M.D.

**Fischer, H.** The Importance of the Acromioclavicular Joint in the Clinical Picture of Painful Stiffening of the Shoulder (Die Bedeutung des Akromioclavicular-Gelenkes im Krankheitsbilde der schmerzhaften Schulterversteifung) *56 Tag d. deutsch. Ges. f. Chir.*, Berlin, 1932

In every case of painful stiffening of the shoulder special attention should be directed to the acromioclavicular joint. The cartilaginous disk in that joint may cause disturbances similar to those produced by the meniscus of the knee. The author reports a case of stiffening of the shoulder in which pain began suddenly but ceased immediately after the injection of morphine into the acromioclavicular joint. The discus had become locked in the joint. After removal of the discus all discomfort ceased. In another case constant pain had been caused for three years by calcification of the discus. Discus locking may be produced by even very minor injuries. Resection of the joint relieves the pain immediately.

In the discussion of this report, PELS-LEUSDEN called attention to the fact that the acromioclavicular joint may become the site of arthritis and that the pain described may be caused by this condition.

STEGEMANN stated that subscapular bursitis may also produce such pain. This is manifested in the roentgenogram by a narrow shadow. The injection of 2 c.c. of a 2 per cent novocain solution relieves the pain.

STETTNER (Z)

**Chaton, M.** A Case of Foreign Bodies in the Elbow Joint—Osteochondrophytic Arthropathy (A propos d'une observation de corps étrangers articulaires du coude—arthropathie osteochondrophytique) *Bull. et mém. Soc. nat. de chir.*, 1932, lxxv, 170

The case reported was that of a man thirty-two years of age who for ten years had had pain in the right elbow with progressive limitation of movement and enlargement of the joint and atrophy of the forearm and for one year had had pain also in the

left elbow. In the right elbow roentgen examination showed enlargement of the ends of both bones and a number of arthrophytes of various sizes in the bend of the flexed elbow. In the left elbow it disclosed hypertrophy of the head of the radius and a joint body in process of elimination from the lower end of the humerus which rested in a niche and was still attached to the lower end of the humerus by a pedicle.

Operation on the right elbow by the transelecranon route disclosed thirty joint bodies the largest of which was the size of a hazelnut. These joint bodies were found in three foci—one in front of the trochlea of the humerus, one in front of the condyle of the humerus, and one at the upper radial joint. One large arthrophyte was still adherent to the head of the radius. The ends of all of the bones showed hypertrophy and dystrophy. The condylar surface of the humerus was destroyed and in its place there was a red granular surface not covered with cartilage. Because of this pathological condition, resection of the lower end of the humerus was done in addition to removal of the joint bodies.

Histological examination of the joint bodies showed a shell of fibrous tissue surrounding a cartilaginous nodule in the center of which there was an accumulation of calcium dust. There was no bone there.

The author concludes that this was a case of dissecting osteochondritis in a very advanced stage. The left elbow showed a beginning stage of the process with the characteristic niche.

Chaston discusses the theories of Koenig, Barth, and Arxhausen with regard to the pathogenesis of the disease and concludes that all of those theories are wrong. He believes that the disease is not a local condition of the epiphysis, but is caused by lesions of the trophic center in the anterior horns of the cord. The latter may be congenital or the result of mild infection.

Chaston's operation was not entirely successful. For similar cases in which joint movement is seriously interfered with he recommends resection of the enlarged and pathological ends of both bones.

In the discussion of this report, SORREL, FLEURY and MOUTIER said that they believed the condition in Chaston's case was osteochondromatosis of the elbow. Sorrel said that he doubted whether persons with this condition would permit complete resection as it might cause more limitation of movement than the disease.

ALBERT GOSWAMI, M.D.

**Reescke: Osteomyelitis of the Hip-Joint Region**  
(Die Osteomyelitis der Hüftgelenkgegend) 567 8  
d. deutsch. Ges. f. Chir. Berlin, 1932.

Reescke reports on twenty-six cases of osteomyelitis of the hip-joint region which were treated in the last ten years. In eleven cases treated in the first eight days of the condition there were three deaths. In six treated in the second week, one death. In four treated after the second week there

were no deaths and in five treated in the stage with multiple active foci there were five deaths.

The original focus may be in the head, neck, or shaft of the femur or in the pelvis. The author refers to the classical work of Koenig, Moeller and von Brunn on osteomyelitis.

Of the cases reviewed, the primary focus was in the femur in eighteen and in the pelvis in eight. In no case was it possible to discover the focus immediately. In eleven cases there was no external rupture. In all of the surviving patients healing was obtained with ankylosis but without sepsis.

The author discusses the advisability of primary resection. Of twenty-one cases (the five in which death occurred early are not considered) operation was performed in four with two deaths. In the remainder which were treated by extension, there were also two deaths. In the two fatal cases treated by extension there was a general dissemination of bacteria from multiple foci. The author says that while attention must be paid to the blood findings, the presence of bacteria in the blood does not always indicate an unfavorable prognosis. He therefore prefers extension treatment. This choice is supported also by the fact that in the acute stage it is impossible to determine the point of origin of the infection, even the roentgenogram cannot be relied upon. A diagnosis of the focus is impossible before three weeks have passed, and by that time the patient's fate is already determined. Extension is preferable to primary resection also because the latter does not improve the functional results. Resection should be considered only when treatment by extension and the opening of any abscess present does not give the desired result. In most cases the general condition improves rapidly after extension.

SEYMOUR (2)

#### SURGERY OF THE BONES, JOINTS, MUSCLES, TENDONS, ETC.

**Trumble H. C. A Method of Fixation of the Hip Joint by Means of an Extra-Articular Bone Graft.** *Australian & New Zealand J. Surg.* 1931  
44 2.

The author briefly discusses the indications and proper time for fusion of the hip joint and advocates the use of some form of extra-articular fixation. He reports three cases in which he employed his own method of fixation. In the latter procedure a stout, free graft from the tibia is placed between the tuberosity of the ischium and the shaft of the femur in the neighborhood of the lesser trochanter. The article contains diagrams and roentgenograms.

PAUL C. COLOMBA, M.D.

**Ottolenghi, G. E.: Extra Articular Arthrodesis of the Hip in Canalgia** (La artrodesi extra-articolare de la cadera en la canalgia). *Rev. de chir. y ortoped.* 1931  
1, 33.

Extra-articular arthrodesis of the hip is done in canalgia to obtain solid, permanent, and stable

immobilization of the joint. It is indicated when the disease has completed the final stage of its evolution. It does not replace orthopedic treatment, but serves as a complement to the latter. It is intended to improve, maintain, or consolidate the results of orthopedic treatment and prevent the consequences of the disease process—mechanical changes, pain, and poor position.

Postoperative immobilization should be maintained for at least eight months in a cast and for four months in a splint. The patient should not be released from all orthopedic appliances until solid union of the graft is certain.

Extra-articular arthrodesis gives good results in children. It may be adapted to the requirements of the particular case.

The description of the technique is amplified by numerous illustrations, several of which are in color. The article includes the histories of twenty-six cases with roentgenograms showing the condition before and after the operation.

EUGENE T. LEDDY, M.D.

Fusari, A. Posterior Tiblo-Astragalar Arthrodesis by the Method of Camera (L'arthrose tibio-astragalienne postérieure d'après Camera). *Arch. franco-belges de chir.*, 1931-2, **xxxi**, 17.

The author reports the results of thirty-three operations performed on thirty-one patients in Camera's clinic. The operation, to which the name "arthrodesis" was given by Mezzari, is similar in purpose to the methods of Putti, Del Torto, Toupet, and Campbell in that it seeks to prevent or limit foot-drop in cases of paralytic equinus. It is much to be preferred to tendon transplantation and tenodesis as it is more definite in its action and does not disturb the normal musculature. The technique is as follows:

With the patient face down, a curved longitudinal incision is made in the skin posterior to the tendon of Achilles from the upper edge of the heel upward about 10 cm. The tendon is then split longitudinally to expose the posterior surface of the astragalus. With the foot in moderate dorsal flexion, a chisel is driven into the bone near the border of the tibia at an angle of 45 degrees to the axis of the leg. With the knee flexed, the anterior surface of the tibia is exposed and a graft about 4 cm. long and 1.5 cm. wide is removed from its cortex. This graft is then driven into the bed in the astragalus made by the chisel and sunk tight with a special instrument made for the purpose, a liberal amount being left projecting to serve as a block against the posterior edge of the tibia. After suture of the tendon and skin a plaster cast is applied and left on for about three months. If the equinus is spastic, a cast is applied with the foot in the corrected position and the operation described is done later through a posterior window.

Most of the patients whose cases are reviewed were between four and ten years of age. Only five were more than ten years old. Ten were spastics.

In three cases preliminary correction by manipulation under anesthesia was necessary. In seven cases additional bone work was done, usually on the astragalus, and in nineteen, tendon work, especially shortening of the extensors, was also necessary. Lengthening of the tendon of Achilles was done only three times. In many cases the graft became surrounded by new callus. In several cases it broke, but, even in these, toe-drop was sometimes prevented. The length of time the patient was kept under observation after the operation ranged from one to six years. In seven cases the operation was performed too recently to permit judgment of the results. Of the twenty-four others, good results were obtained in twenty. In many cases not only correction of the equinus deformity, but also a decrease in the contracture of the tendon of Achilles, was obtained.

The results of posterior bone block by all methods are in general very gratifying, and those obtained by the Camera procedure compare very favorably with those of other methods.

WILLIAM ARTHUR CLARK, M.D.

## FRACTURES AND DISLOCATIONS

Kment, H. The Treatment of Acromioclavicular Dislocation (Zur Behandlung der Luxatio acromioclavicularis). *Zentralbl. f. Chir.*, 1932, p. 410.

Dislocation of the clavicle at the lateral end of the bone is usually upward. The dislocation is complete only when both the external and the internal portions of the posterior coraco-acromial ligament are torn away with it. Reposition is easily accomplished by outward rotation and elevation of the arm, but the reduction cannot be maintained by conservative measures and bandages. Of the numerous operative methods proposed, the majority are unable to prevent recurrence with certainty. The result is unsatisfactory also from the functional standpoint.

In 1861, Cooper performed a resection of the articular surfaces and followed it with a wire suture. Buedinger and Kirchmayr overcame the danger of recurrence by boring through the acromion and clavicle and leaving the drill in place at first. Steinmann and Narath employed *nailing*. When treated in this manner, the joint remains completely stiff and immovable. Schloffer makes use of a special wire suture placed in a special way so that redislocation is impossible while the wire remains in place. In this procedure the clavicle is bored through twice in a perpendicular direction and the acromion is bored through once in an oblique direction. The procedure is shown by drawings. A particularly strong wire is drawn through the drill holes and pulled taut. The ends of the bone are then brought into position and the wire is again drawn up tight. The bones must not lie directly under the skin. The suture can be covered by the trapezius muscle by the plastic procedure of Elmgreen. At the Prague clinic

left elbow. In the right elbow roentgen examination showed enlargement of the ends of both bones and a number of arthrophytes of various sizes in the bend of the flexed elbow. In the left elbow it disclosed hypertrophy of the head of the radius and a joint body in process of elimination from the lower end of the humerus which rested in a niche and was still attached to the lower end of the humerus by a pedicle.

Operation on the right elbow by the transelecranon route disclosed thirty joint bodies, the largest of which was the size of a hazelnut. These joint bodies were found in three foci—one in front of the trachea of the humerus one in front of the condyle of the humerus, and one at the upper radio-ulnar joint. One large arthrophyte was still adherent to the head of the radius. The ends of all of the bones showed hypertrophy and dystrophy. The condylar surface of the humerus was destroyed and in its place there was a red granular surface not covered with cartilage. Because of this pathological condition, resection of the lower end of the humerus was done in addition to removal of the joint bodies.

Histological examination of the joint bodies showed a shell of fibrous tissue surrounding a cartilaginous nucleus in the center of which there was an accumulation of calcium dust. There was no bone tissue.

The author concludes that this was a case of dissecting osteochondritis in a very advanced stage. The left elbow showed a beginning stage of the process with the characteristic alveoli.

Chaston discusses the theories of Koenig, Barth, and Arxhausen with regard to the pathogenesis of the disease and concludes that all of these theories are wrong. He believes that the disease is not a local condition of the epiphysis, but is caused by lesions of the trophic center in the anterior horns of the cord. The latter may be congenital or the result of mild infection.

Chaston's operation was not entirely successful. For similar cases in which joint movement is seriously interfered with he recommends resection of the enlarged and pathological ends of both bones.

In the discussion of this report, SOWEN, FLUKE and MCGOWAN said that they believed the condition in Chaston's case was osteochondromatosis of the elbow. Soren said that he doubted whether persons with this condition would permit complete resection as it might cause more limitation of movement than the disease. *ANNALS OF THE NEW YORK ACADEMY OF MEDICINE*

Rieschke: Osteomyelitis of the Hip-Joint Region (Die Osteomyelitis der Hüftgelenkgegend) 56 T. 3. *Deutsch. Ges. f. Chir. Berlin*, 1913

Rieschke reports on twenty-six cases of osteomyelitis of the hip-joint region which were treated in the last ten years. In eleven cases treated in the first eight days of the condition there were three deaths; in six treated in the second week, one death; in four treated after the second week there

were no deaths, and in five treated in the stage with multiple active foci there were five deaths.

The original focus may be in the head, neck, or shaft of the femur or in the pelvis. The author refers to the classical work of Koenig, Miescher and von Brunn on osteomyelitis.

Of the cases reviewed, the primary focus was in the femur in eighteen and in the pelvis in eight. In no case was it possible to discover the focus immediately. In eleven cases there was no external rupture. In all of the surviving patients healing was obtained with ankylosis but without sequestra.

The author discusses the advisability of primary resection. Of twenty-one cases (the five in which death occurred early are not considered) operation was performed in four with two deaths. In the remainder which were treated by extension, there were also two deaths. In the two fatal cases treated by amputation there was a general dissemination of bacteria from multiple foci. The author says that while attention must be paid to the blood sequestra, the presence of bacteria in the blood does not always indicate an unfavorable prognosis. He therefore prefers extension treatment. This choice is supported also by the fact that in the acute stage it is impossible to determine the point of origin of the infection; even the roentgenogram cannot be relied upon. A diagnosis of the focus is impossible before three weeks have passed, and by that time the patient's fate is already determined. Extension is preferable to primary resection also because the latter does not improve the functional results. Resection should be considered only when treatment by extension and the opening of any abscesses present does not give the desired result. In most cases the general condition improves rapidly after extension. *STRENGTH (2)*

#### SURGERY OF THE BONES, JOINTS, MUSCLES, TENDONS, ETC.

Tromble, H. C.: A Method of Fixation of the Hip Joint by Means of an Extra-Articular Bone Graft. *Australian & New Zealand J. Surg.* 1913 443.

The author briefly discusses the indications and proper time for fusion of the hip joint and advocates the use of some form of extra-articular fixation. He reports three cases in which he employed his own method of fixation. In the latter procedure a stout, free graft from the tibia is placed between the tuberosity of the ischium and the shaft of the femur in the neighborhood of the lesser trochanter. The article contains diagrams and roentgenograms. *PART C. COLEMAN, M.D.*

Ottolenghi, G. E.: Extra Articular Arthrodesis of the Hip in Coalgia (La artrodesi extra-articolare da la cadera en la coalgia). *Rev. de chir. y ortoped.* 1913 1, 55.

Extra-articular arthrodesis of the hip is done in coalgia to obtain solid, permanent, and stable

The results as regards the range of motion were good in 80 per cent of the cases and poor in 8 per cent.

The authors' conclusions are as follows

1 Closed reduction is the treatment of choice in congenital dislocation of the hip when a stable complete reduction can be obtained by the described method without much traumatism

2 Attempts at closed reduction frequently fail either primarily or secondarily. Repeated manipulations are rarely successful and often result in considerable damage to the hip

3 The chief causes of failure of closed reduction are the obstructions offered by the constricted capsule and labrum glenoidale and the redundant ligamentum teres

4 A shallow acetabulum with an oblique roof frequently permits redislocation. In cases with an acetabulum of this type open reduction usually with deepening of the acetabulum is advisable. If exposure of much bone is required a shelf operation is preferable

5 Open reduction is almost always successful primarily. When redislocation occurs it usually takes place shortly after the removal of the plaster. Therefore the hip should be carefully watched at this time, particular attention being paid to roentgenograms made with the patient standing. Secondary manipulations to improve the reduction have been of little value.

6 The shelf operation results in less stiffening than the gouging of a new socket out of bone and is therefore preferable when the femoral head cannot be brought down to the level of the acetabulum or the socket is so shallow or oblique that maintenance of reduction, even with gouging of cartilage, is hopeless

7 When the deformity is 45 degrees correction of antversion is usually advisable unless a shelf operation is done

8 Examination eighteen months or more after the operation in the cases reviewed showed maintenance of the reduction in 61 per cent of the hips, subluxation in 31 per cent, and redislocation in 8 per cent. A good functional result was obtained in 67 per cent

9 Fatigue, limp, and limitation of motion were frequent residual symptoms after open reduction of hips which had become redislocated and in those in which gouging of bone was done

10 Coxa plana is not infrequent after reductions of congenital dislocation of the hip, but seems to be unrelated to damage to, or removal of, the ligamentum teres, maintenance of reduction, or the type of operation

ELVEN J. BERKHEISER, M.D.

Colonna, P. C. Congenital Dislocation of the Hip in Older Subjects, Based on a Study of Sixty-Six Open Operations. *J. Bone & Joint Surg.*, 1932, xiv, 277

The author reports the results of sixty-six open operations for congenital dislocation of the hip in

fifty-six patients. Forty-seven of the patients were over five years of age. Obstacles to reduction were maldevelopment of the acetabulum, contraction of the capsule, and shortened pelvotrochanteric muscles. In six cases osteotomy was done to correct the anterior torsion. In seven hips the head of the femur was replaced in the original acetabulum, in thirty-one, it was placed in a reamed-out acetabulum, in eight, an osteoplastic buttress was formed, and in five, some combination of reaming out of the acetabulum and the formation of an osteoplastic buttress was employed. In four hips, anterior transposition was performed, in eight, a Lorenz bifurcation was done, and in four, the head of the femur with the capsule over it was transplanted into a reamed-out acetabulum.

The reaming operation gave stability, but very little motion. The osteoplastic buttress usually prevented further upward riding, but corrected the characteristic gait only partially when the posterior position was not overcome. The bifurcation operation gave good results and is recommended especially for painful bilateral congenital dislocation of the hip in adults. Colonna is encouraged to continue the reaming operation with preservation of the synovial covering of the femoral head by suturing the capsule over it. Of the four hips subjected to this procedure, three showed useful motion when they were re-examined a little over a year after the operation.

WALTER P. BLOUNT, M.D.

Magnus. Fractures of the Femur (Oberschenkelbrüche). *56 Tag d. deutsch. Ges. f. Chir.*, Berlin, 1932

In the period from 1925 to 1929, 440 cases of recent fracture of the femur were admitted for treatment in Bergmannsheil, 46 cases of old fracture were admitted for after-treatment, 125 cases were referred for advice, and 272 cases were admitted for examination on account of litigation. The total number of cases was therefore 883.

In 19 per cent of the total number of cases the part involved was the head and neck of the femur, in 6.6 per cent the condyles, and in 74.4 per cent the shaft. In 43.2 per cent the fractures were complicated.

In the 440 cases treated primarily at Bergmannsheil there were 440 fractures. Of the latter, 229 involved the shaft, 110 the hip-joint portion of the bone, and 31 the condyles. Forty-six (10.2 per cent) were complicated. Of 7 deaths, 2 occurred from hemorrhage immediately after the patient's admission to the hospital and 5 from emboli between the second and seventeenth days after his admission.

Magnus' method of treatment is the same as that of von Brunn, namely, wire extension applied to the head of the tibia. The hip and knee joints are maintained in a semi-flexed position and no splinting of any kind is employed. The knee is supported from beneath by a cushion, and the foot is suspended to the extension cord. Boehler's claim that wire extension increases the frequency of flail knee has not been substantiated by Magnus' experience. In no case

eleven patients have been treated with good results in this manner. In one case the wire broke later and in another it cut through the bone, but even in these cases the end-results were good. Physical therapy should be begun at the end of a week to prevent ankylosis. E. WILKES (2)

Santos, J. Y.: Changes Which the Articular Cartilage of the Hip Joint May Undergo. *Surg Gynec & Obst* 33: 414-450

This article deals with the changes noted on microscopic examination of femoral heads years after intracapsular fractures of the femur. Evidence is presented to prove that an active formation of new cartilage may occur after resorption of the old cartilage. The article is summarized as follows:

In a series of cases of atrophy of the femoral head and the acetabulum following a complete intracapsular fracture of the neck of the femur degenerative and proliferative changes have frequently been noted in the articular cartilage. Following the degenerative change, a reparative process, which simulates that occurring in atrophic bone, takes place in the articular cartilage. This consists in an invasion of the cartilage by the underlying marrow which begins at the upper portion and gradually spreads along the lateral circumference with absorption and replacement of the cartilage in its course and the subsequent formation of choroidal marrow cavities. However the process is observed only in the femoral head and acetabulum in which the blood supply remained intact following the fracture. It fails to occur in the head which undergoes necrosis due to vascular interruption. The resorption may be brought about by (1) multi-nucleated giant cells (osteoclastic resorption) (2) connective tissue (fibroblastic resorption) (3) blood vessels (vascular resorption) or (4) a combination of these agents.

Following the degenerative change in the articular cartilage and its gradual resorption by the underlying marrow there is an active formation of new hyaline cartilage from the permes that covers the joint surface of the articular cartilage and from the proliferation of surviving cells of the articular cartilage generally those in the deeper layer. The former process is limited in extent and now and then may be noted also on the articular surface of a necrotic femoral head. The latter however may sometimes be sufficiently marked to replace the whole thickness of the articular cartilage and thus lead to partial or complete re-formation of the articular layer. It usually begins about the choroidal spaces and is found only in alive femoral heads and acetabula. These facts indicate that the reparative process is of importance in the subsequent proliferation of the old cartilage cells. Subchondral marrow invasion of the articular cartilage has been noted before in cases of arthritis deformans and tabetic arthropathy but in the studies herewith reported the histological examination revealed no other pathological condition besides the osteoporotic due

to disease. The part played by the atrophy in the process is probably not of much importance as changes similar to those observed cannot be demonstrated in aseptic osteoporosis and were not found in disease atrophy of the upper femoral epiphysis of nine years duration. GEORGE L. COY, M.D.

Howarth, M. B., and Smith, H. W.: Congenital Dislocation of the Hip Treated by Open Operation. A Report of Seventy-Two Cases. *J Bone & Joint Surg* 33: 214-229.

The authors report seventy-two cases of congenital dislocation of the hip which were treated by open operation at the New York Orthopedic Hospital in the period from 1920 to 1929.

Most of the patients were between three and five years of age. The oldest was twenty and the youngest one and a half years old.

In forty-six cases the dislocation was unilateral. Of the twenty-six cases in which it was bilateral, a bilateral open operation was done in only ten as in sixteen one hip was reduced by the closed method. All of the dislocations were of the anteroposterior type. In the cases of patients under three years of age there was an average anterior torsion of 35 degrees.

In 50 per cent of the cases from one to five attempts at closed reduction had been made.

At operation the Smith-Petersen approach was used without preliminary traction. As a rule the anteroposterior half of the capsule was divided parallel with and close to the acetabulum. In thirty-four hips the constriction in the capsule was divided, and in thirty-five the ligamentum teres was removed.

In 34 per cent of the cases simple reduction was possible. Only a pad of fat or fibrous tissue was removed from the acetabulum or the acetabulum was left intact. In 42 per cent of the cases the acetabulum was gouged out and in 11 per cent a shelf operation was performed.

Thirty of the acetabula were shallow fourteen were filled with fat and fibrous tissue and twenty were good sockets.

The ligamentum teres was absent in five hips, ruptured in two and thin in seven.

In fifty-six hips the capsule and labrum glenoidale were found constricted.

Additional operations were required in six cases.

Closed reduction for redislocation after an open operation was successful in one of two cases in which it was attempted.

In thirty-eight hips a supracondylar osteotomy was done to correct anteversion of more than 25 per cent.

One patient died during the operation and in developed trivial superficial infections.

In the postoperative care a plaster hip spica was applied with the hip in extension, abduction of 30 degrees, and lateral rotation. Its removal after an average of three months was followed by massage and active and passive exercises.

The results as regards the range of motion were good in 80 per cent of the cases and poor in 8 per cent.

The authors' conclusions are as follows:

1 Closed reduction is the treatment of choice in congenital dislocation of the hip when a stable complete reduction can be obtained by the described method without much traumatism.

2 Attempts at closed reduction frequently fail either primarily or secondarily. Repeated manipulations are rarely successful and often result in considerable damage to the hip.

3 The chief causes of failure of closed reduction are the obstructions offered by the constricted capsule and labrum glenoidale and the redundant ligamentum teres.

4 A shallow acetabulum with an oblique roof frequently permits redislocation. In cases with an acetabulum of this type open reduction usually with deepening of the acetabulum is advisable. If exposure of much bone is required a shelf operation is preferable.

5 Open reduction is almost always successful primarily. When redislocation occurs it usually takes place shortly after the removal of the plaster. Therefore the hip should be carefully watched at this time, particular attention being paid to roentgenograms made with the patient standing. Secondary manipulations to improve the reduction have been of little value.

6 The shelf operation results in less stiffening than the gouging of a new socket out of bone and is therefore preferable when the femoral head cannot be brought down to the level of the acetabulum or the socket is so shallow or oblique that maintenance of reduction, even with gouging of cartilage, is hopeless.

7 When the deformity is 45 degrees correction of anteversion is usually advisable unless a shelf operation is done.

8 Examination eighteen months or more after the operation in the cases reviewed showed maintenance of the reduction in 61 per cent of the hips, subluxation in 31 per cent, and redislocation in 8 per cent. A good functional result was obtained in 67 per cent.

9 Fatigue, limp, and limitation of motion were frequent residual symptoms after open reduction of hips which had become redislocated and in those in which gouging to bone was done.

10 Coxa plana is not infrequent after reductions of congenital dislocation of the hip, but seems to be unrelated to damage to, or removal of, the ligamentum teres, maintenance of reduction, or the type of operation.

ELVEN J. BERKEHEISER, M.D.

Colonna, P. C. Congenital Dislocation of the Hip in Older Subjects, Based on a Study of Sixty-Six Open Operations. *J. Bone & Joint Surg.*, 1932, XI, 277.

The author reports the results of sixty-six open operations for congenital dislocation of the hip in

fifty-six patients. Forty-seven of the patients were over five years of age. Obstacles to reduction were maldevelopment of the acetabulum, contraction of the capsule, and shortened pelvotrochanteric muscles. In six cases osteotomy was done to correct the anterior torsion. In seven hips the head of the femur was replaced in the original acetabulum, in thirty-one, it was placed in a reamed-out acetabulum, in eight, an osteoplastic buttress was formed, and in five, some combination of reaming out of the acetabulum and the formation of an osteoplastic buttress was employed. In four hips, anterior transposition was performed, in eight, a Lorenz bifurcation was done, and in four, the head of the femur with the capsule over it was transplanted into a reamed-out acetabulum.

The reaming operation gave stability but very little motion. The osteoplastic buttress usually prevented further upward riding, but corrected the characteristic gait only partially when the posterior position was not overcome. The bifurcation operation gave good results and is recommended especially for painful bilateral congenital dislocation of the hip in adults. Colonna is encouraged to continue the reaming operation with preservation of the synovial covering of the femoral head by suturing the capsule over it. Of the four hips subjected to this procedure, three showed useful motion when they were re-examined a little over a year after the operation.

WALTER P. BLOUNT, M.D.

Magnus. Fractures of the Femur (Oberschenkelbrüche). *56 Tag d. deutsch. Ges. f. Chir.*, Berlin, 1932.

In the period from 1925 to 1929, 440 cases of recent fracture of the femur were admitted for treatment in Bergmannsheil, 46 cases of old fracture were admitted for after-treatment. 125 cases were referred for advice, and 272 cases were admitted for examination on account of litigation. The total number of cases was therefore 883.

In 19 per cent of the total number of cases the part involved was the head and neck of the femur, in 6.6 per cent the condyles, and in 74.4 per cent the shaft. In 43.2 per cent the fractures were complicated.

In the 440 cases treated primarily at Bergmannsheil there were 449 fractures. Of the latter, 229 involved the shaft, 110 the hip-joint portion of the bone, and 31 the condyles. Forty-six (10.2 per cent) were complicated. Of 7 deaths, 2 occurred from hemorrhage immediately after the patient's admission to the hospital and 5 from emboli between the second and seventeenth days after his admission.

Magnus' method of treatment is the same as that of von Brunn, namely wire extension applied to the head of the tibia. The hip and knee joints are maintained in a semi-flexed position, and no splinting of any kind is employed. The knee is supported from beneath by a cushion, and the foot is suspended to the extension cord. Boehler's claim that wire extension increases the frequency of flail knee has not been substantiated by Magnus' experience. In no case



has a supporting apparatus been necessary. In refractory supracondylar fractures another wire is placed through the lower fragment of the femur to exert a pull forward. The wire for the extension may be placed next to the point of fracture without fear of complications from the incisions. Wire extension is employed even in the cases of children, but in the latter in order to prevent injury to the epiphyseal line, the wire is placed through the tibial diaphysis. This is done also in the cases of adults when there are rare areas about the knee joint. Adhesive plaster extension is no longer employed. Krupp rustless wire 1.5 mm. thick is used and is driven through the bone with an electric motor. The extension stirrup used is that of Beck. The longest time during which the wire is left *in situ* is eight months. In 3 cases an in consequential superficial infection developed and in the case of an idiot there was osteomyelitis of the head of the tibia with empyema of the knee joint. Open operation was performed in only 4 cases. In 1 of these there was interposition of muscular tissue. The interposition was corrected with the help of the instrumentarium described by Kligman. In no instance was a plaster dressing applied at the beginning of treatment and only occasionally was it applied later.

In 75.5 per cent of the cases healing occurred without shortening of the limb. In only 15.1 per cent was there shortening of more than 1.5 cm. and in only 5 (0.7 per cent) was it more than 5 cm. Lengthening of the limb was observed in 0.7 per cent of the cases, but in only 1.5 per cent was it more than 1.5 cm. A difference of not more than 1.5 cm. is of no practical importance.

In the study of the functional results special attention was paid to the mobility of the joint. In cases of high fracture the abduction of the hip joint averaged 34 degrees (in the cases treated elsewhere 2 degrees) as compared with a normal abduction of 55 degrees. Average flexion was 10.55 degrees (in cases treated elsewhere, to 63 degrees) as compared with a normal flexion to 30 degrees. In the knee joint the average flexion was 10.63 degrees (in cases treated elsewhere, to 81 degrees, and in patients operated upon, to 105 degrees) as compared with a normal flexion to 35 degrees. In cases of supracondylar fracture the knee could be flexed to 91 degrees, and in cases operated upon to 115 degrees.

In the cases of medial fracture of the neck of the femur the average period of disability was one hundred and forty-two days (in cases treated elsewhere, two hundred and seventy-four days). The immediate compensation averaged 50 per cent (in cases treated elsewhere, 53 per cent) and after three years was decreased to 36 per cent (in cases treated elsewhere 43 per cent). In cases of lateral fracture of the neck the period of disability averaged one hundred and forty-seven days (in cases treated elsewhere, one hundred and thirty-five days) the compensation averaged at first 42 per cent (in cases treated elsewhere, 33 per cent) and after three years was decreased to 34 per cent. In all fractures

involving the hip-joint region the average disability was one hundred and thirty-nine days, while in the cases subjected to operation elsewhere it was two hundred and thirty-nine days. The difference in the amount of compensation paid was similar the percentages being 39 and 50 per cent at first and 30 and 50 per cent after three years. In fractures of the shaft of the femur including those treated elsewhere, the average period of disability ranged from four to six months and the compensation after three years averaged 24 per cent. In the cases operated upon elsewhere the period of healing averaged three months longer the initial compensation averaged 53 per cent as compared with 36 per cent in the cases treated at Bergmannshof, and the compensation after three years averaged 54 per cent as compared with 34 per cent in the cases treated at Bergmannshof. In the cases of supracondylar and condylar fractures operative treatment increased the period of disability from one hundred and four to two hundred and fifty-six days and the compensation in the proportion. Therefore in these fractures the results of open operation are less satisfactory than those of treatment by wire extension.

In the discussion of this report, KRANKER (Aachen) presented the following table compiled from the reports of mutual benefit associations to show the conditions and incidence of cure of fractures of the neck of the femur.

	Age (years)										Total
	10-14	15-19	20-24	25-29	30-34	35-39	40-44	45-49	50-54	55-59	60-64
Cases treated at Bergmannshof	16	3	7	10	10	10	10	10	10	10	10
Not treated by Bergmannshof											
Plaster cast											
Average period of disability (in months)											
Immediate compensation											
After three years											

Of the 305 patients 8 (3.6 per cent) died. Three died from pulmonary complications in the age period from seventy to ninety years, 1 died from thrombosis, and 4 died from an unknown cause. The fractures were most common between the ages of sixty and sixty-nine years. About half of the patients were treated in their homes. Most of the others were treated in small country hospitals and only a few in institutions devoted to clinical surgery. Seventeen were treated by bone-setting in country districts. Only 8 (3.6 per cent) were treated with a plaster cast. It is evident that in the majority of the cases the period of treatment was far too brief. The period of fixation should average three months and should be followed by an equally long period of ambulatory care. All of the patients who were treated surgically developed stiffness of the hip joint. The shortening ranged from 3.3 to 1.5 cm. The position of the limb was satisfactory in only a small percentage of the cases. Even in the cases of patients between ten and nineteen years of age it was satisfactory in only 45 per cent. External

rotation was not sufficiently corrected. In the young, free mobility was retained in only half of the cases, and in the aged, in not more than 13 per cent.

The compensation was as follows

Compensation (%)	10-19	20-29	30-39	40-49	50-59	60-69	70-90
None	38	30	10	16	6.5	1	5
10-20	25		20	32	40	7	18
20-40	33	40	30	40	30	28	27
40-60	6	15	20	8	14	22	20
60-80		15	10				
80-100			10	4	16	7	30

In conclusion Krahbel said that it would be of value to mutual benefit associations and industry if the Whitman method of treatment with a plaster cast were brought more insistently to the attention of general practitioners. STETTINER (Z)

Cubbins, W. R., Conley, A. H., Callahan, J. J., and Scuderi, C. S. A New Method of Operating for the Repair of Ruptured Crucial Ligaments of the Knee Joint. *Surg., Gynec. & Obst.*, 1932, lv, 299

The work of various British and American surgeons in the repair of ruptured crucial ligaments is reviewed. In a series of about 200 severely injured knee joints the authors were unable to demonstrate a rupture of the tibial and collateral fibular ligaments. They endorse Gallie's method of repairing the posterior crucial ligament, but believe that an operation which will reconstruct both ligaments at one time is preferable.

In the procedure described by the authors a posterolateral incision about 12 in. long is made from above the middle of the thigh down to a point about 1 in. below the head of the fibula. Through this incision new ligaments are constructed from the tendons and aponeurosis of the biceps and a strip of fascia from the vastus lateralis. The new ligaments are made about 10 in. long and are slightly twisted. They are left attached at their distal ends. The knee joint is opened through a linear incision medial to the patella and a  $\frac{3}{8}$ -in. drill opening is made through the medial condyle at its anterior upper portion above the cartilaginous line, extending back and downward to the upper portion of the intercondylar notch at the normal anterior insertion of the posterior crucial. A second drill hole is made in the medial surface of the medial tuberosity of the tibia so that it emerges just in front of the anterior spine, and then, through a lateral incision, a third drill hole is made into the posterior portion of the lateral condyle, extending into the intercondylar notch of the knee joint. The newly constructed crucial ligaments are passed through these holes in such a way that they correspond to the normal position of the ligaments, and the loose ends are sutured to the periosteum overlying the adjacent bony structures. The wounds are closed, but a completely water-tight closure is avoided. Fixation in plaster for about four weeks is followed by

passive and active motion at the end of six weeks. Walking is permitted at the end of fourteen weeks.

In the cases in which this procedure has been used excellent results have been obtained.

ARTHUR H. WEILAND, M.D.

Lapidus, P. W. Longitudinal Fractures of the Patella. *J. Bone & Joint Surg.*, 1932, xiv, 351

Longitudinal fractures of the patella usually occur at the junction of the outer quarter of the patella with the main portion. The mechanism of their production is direct or indirect violence produced by the action of the vastus lateralis as the patella rides laterally over the external condyle of the femur in flexion of the knee.

The diagnosis depends upon a history of trauma, an intra-articular effusion (hæmarthrosis) limitation of motion, a localized linear tenderness over the lateral border of the patella, and the findings in the roentgenogram. A fracture of this type is not revealed by ordinary anteroposterior and lateral roentgenograms. Its demonstration requires a special technique in which a postero-anterior oblique view is obtained with the knee acutely flexed and rotated externally 15 degrees while the patient lies on his abdomen with the film under the patella. Congenital anomalies should be ruled out by taking roentgenograms of both patellæ.

Treatment by repeated aspirations shortens the disability. Immobilization for from three to five days should be followed by strapping of the knee and moderate use of the joint in walking. Operative measures are contra-indicated.

J. ELVEN BERKHESER, M.D.

Basset, A. Temporary Removal and Replacement of the External Malleolus in the Operative Treatment of Malunion at the Ankle (L'ablation temporaire et la réposition de la malléole péronière dans le traitement opératoire de certains cas vicieux du cou-de-pied). *J. de chir.*, 1932, xxxix, 487

The condition for which the described operation is done is Pott's fracture with the common deformity, external posterior displacement of the lateral malleolar fragment and slight mesial rotation of the astragalus.

Through an incision over the outer side of the ankle the external malleolus is completely removed. Excess of callus and other tissue preventing good reduction are also removed and the astragalus is forced into the normal position. When the external malleolus is replaced it is fastened with screws against the freshened surface of the tibia. It adheres to the latter like a graft, thereby forming a bimalleolar tibia. This close approximation of the graft holds the astragalus in normal relationship to the tibia. A bridge of callus unites the upper end of the malleolar graft to the lower end of the fibula. If the fracture deformity is of long standing and firmly consolidated osteotomy of the fibula just above the fracture line is done but if the callus is still

soft the fragment may be dislodged by leverage with a chisel. If the internal malleolus is markedly displaced a medial incision is necessary to replace it before the astragalus can be completely reduced.

Before the external malleolar fragment is replaced its internal surface is freshened to correspond to the freshened surface of the tibia. If the fragment is very short it must be placed a little higher than normal in order that the screws may penetrate the tibia well above the articular surface. One long slender metal screw is sufficient.

The wounds are closed without drainage and a temporary splint is applied. If the roentgenogram shows satisfactory reduction a cast is applied for two months.

The author reports three cases. The first was that of a woman fifty nine years of age who was operated upon forty-one days after fracture of both malleoli with displacement. Closed reduction had been tried without success the day after the injury. Incisions over both malleoli were necessary. A roentgenogram made thirteen days after the operation showed the astragalus in good position

and the intermalleolar mortise nicely reconstructed. When re-examined two years later the ankle showed thickening due mostly to edema. Slight valgus of the foot persisted, but the patient walked well without a limp.

The second case was that of a woman forty-nine years of age who had a long oblique fracture of the external malleolus with external separation, widening of the mortise, and a marked valgus deformity. Operation was performed about three months after the injury. A year later the ankle was of practically the same size as the other one and the patient walked well.

The third case was that of a woman fifty-six years old who had fractures of both malleoli in typical valgus position. Operation was performed a month after the injury. It was necessary to fixate both of the malleoli with screws. Six months following the operation there was no valgus deformity. Dorsal flexion was possible to 90 degrees, plantar flexion was normal, and the patient was able to walk without a limp.

WILLIAM ARTHUR CLARK, M.D.

# SURGERY OF THE BLOOD AND LYMPH SYSTEMS

## BLOOD VESSELS

Pearse, H E, Jr, and Morton, J J The Blood Pressure in the Arteries of the Extremities in Normal Subjects and in Patients with Peripheral Vascular Disease *Am J M Sc*, 1932, CLXXXII, 485

A change in posture of the lower extremities materially alters the blood pressure in the arteries of the limbs. It influences also the strength of the pulsation of the vessels. When the leg is in the dependent position, the systolic and diastolic pressures increase and the pulsation is maximal. Elevation of the limb has the opposite effect. This fact explains the phenomena observed with a change in the position of a limb afflicted with severe arterial disease. Elevation of such a limb results in blanching, pallor, and even a cadaveric appearance. The ischæmia is produced at a different angle in different individuals, depending upon the amount of arterial involvement. Lowering of the diseased limb with a consequent increase in the blood pressure and the strength of the pulse allows more blood to be forced through the narrowed channels.

In the management of patients with peripheral vascular disease, this effect of position upon the circulation must be considered. If the circulation is incompetent, the limb should be elevated only during brief periods for the purpose of exercise. Slight lowering of the leg to increase the intravascular pressure would appear to be beneficial, but this should never be done to the extent of causing rubor or cyanosis as under such circumstances œdema may result.

In the treatment of peripheral vascular lesions it is essential to know the condition of the main arteries as well as that of the arteriolar and subpapillary branches. The vasoconstrictor influence upon the latter structures is demonstrated by a response of the skin temperature to known agents. The state of the main arteries can be determined only by estimating the perceptible pulse or by oscillometry. SAMUEL KAHN M D

Brown, G E Erythromelalgia and Other Disturbances of the Extremities Accompanied by Vasodilatation and Burning *Am J M Sc*, 1932, CLXXXII, 468

Erythromelalgia, first described by Mitchell, is a vasomotor disturbance of unknown cause. Statistics at the Mayo Clinic indicate that it is found in approximately 1 of every 200 cases of peripheral vascular disease and in 1 of every 40,000 patients registered at the clinic each year.

Four criteria essential to the diagnosis are (1) bilateral burning pain in the extremities, (2) a sharp

increase of local heat in the affected parts, (3) production and aggravation of the distress by heat and exercise, and (4) relief from rest, cold, and elevation.

During the attacks the temperature of the affected parts rises to or exceeds 33 or 34 degrees C and pain usually begins when this temperature is reached. An increase in arterial pulsation and the rate of loss of heat constitute further evidence of the marked dilatation of arteries.

It is important to differentiate the condition from other diseases in which there is burning pain in the hands and feet, such as polycythæmia vera with burning disturbances in the acral portions. Vasodilatation is present also in certain cases of peripheral neuritis, especially those due to heavy metals such as thallium, mercury, and arsenic. Cases of gout are at times confusing. Difficulty in the differential diagnosis is encountered especially in the cases of older subjects with evidence of peripheral and general arteriosclerosis whose chief complaint is burning of the extremities.

The perception of pain in relation to surface temperature is of interest. Sensitivity of the patient must play a part, and intermittency of the periods of vasodilatation is important.

Since excess volume of the flow of blood is the basis of the symptoms, gangrene and trophic changes should not ensue.

The treatment of erythromelalgia is still unsatisfactory, but two of the cases observed by Brown responded well to the local application of radium.

## BLOOD, TRANSFUSION

Ruedel Do the Usual Procedures Protect Against the Dangers of Blood Transfusion? (Schuetzen die gebräuchlichen Hilfsmittel vor den Gefahren der Bluttransfusion?) *Zentralbl f Chir*, 1932, p 60

In the ninety-five blood transfusions performed during the last six years in the Würzburg Clinic, reactions occurred twenty-four times. Eight were mild complications with chills, sweating, and fever, eight were moderately severe, with lumbar pain, vomiting, and exanthem, and eight were severe, with icterus, dyspnoea, cyanosis, hæmoglobinuria, and pulmonary œdema. Four of the latter resulted in death.

The reactions occurred chiefly after transfusion for blood diseases (fifteen cases). They were associated most frequently with blood of Group 2 (nineteen cases) and 4 (eight cases). It is assumed that in these groups there are subgroups, the exact determination or exclusion of which is difficult by the usual blood-grouping methods or biological tests. It is recommended that in addition to blood typing and biological tests, crossed agglutination be

done. It seems rather doubtful whether patients belonging to Group 4 can be considered universal recipients.

In the discussion of this report, TRAUX called attention to the fact that, particularly in Receptor A, extra agglutinins and subgroups are present which doubtless are responsible for many inexplicable reactions following blood transfusion. To prevent reactions he recommended the use of the reagent glass method of blood typing, by which it is possible to determine the characteristics of the corpuscles as well as those of the serum. He considers the exclusive use of the slide method to be inadequate.

GUSTAV ROSENBERG (2)

Hallberg, K.: Immunotransfusion in the Treatment of Severe Septic General Infections (Immunotransfusion als Behandlung bei schweren septischen Allgemeininfektionen) *Acta Chirurg. Scand.* 193 193, 3 4.

The author reports four cases of severe septic general infections which were treated with good results by immunotransfusion at the surgical clinic of Upsala.

In 1919 Wright suggested combining the simple blood transfusion, which during the Great War proved useless in the treatment of sepsis, with preliminary vaccination of the donor. At the same time he published his first favorable experience with this procedure. A review of the literature shows that the method has not received as wide adoption as its results seem to warrant.

All of the author's patients recovered. Hallberg attributes their recovery chiefly to the immunotransfusion which apparently was able to arrest the septic condition. Two of the patients had received an ordinary blood transfusion previously without benefit. In spite of the results in his cases, the author was against overrating the method.

Donor and recipient should preferably belong to the same blood group. In Hallberg's cases the preliminary treatment of the donor consisted of subcutaneous injections of an autogenous vaccine of the patient obtained by cultures from the blood or some metastatic focus. The donor reported no discomfort.

The author states that in urgent cases a stock vaccine may be used if an autogenous vaccine is not available.

# SURGICAL TECHNIQUE

## OPERATIVE SURGERY AND TECHNIQUE, POSTOPERATIVE TREATMENT

Lapointe, Duchon, Darfeuille, and Jonard Post-operative Bronchopulmonary Infections and Their Prevention by Lysate Vaccines (Les infections bronchopulmonaires postopératoires et leur prévention par les lysats-vaccins) *Presse méd*, Par, 1932, xl, 233

The pathogenesis of postoperative bronchopulmonary infections is often difficult to determine. Seasonal variations and the type of anaesthesia used for the operation seem to be of secondary importance as the process is complex, including mechanical difficulties with the diaphragm, nervous disturbances, especially disturbances in the vagosympathetic system, and other factors such as the release of proteins from the contused tissues as in shock. Like bacterial proteins, the proteins released from the injured tissues may cause the formation of antibodies and in this way protect against latent infections.

Whatever their pathogenesis, the cause of pulmonary complications is infection. According to some, the infection is due to bacterial emboli carried to the lung from the operative field. The authors believe that the lung becomes involved by infection descending through the bronchi. They reject the embolic theory for the following reasons:

- 1 It is difficult to understand how organisms from an operation on the stomach can traverse the liver without leaving any trace or why organisms which usually travel by way of the lymphatics should take a venous route.

- 2 Anatomical examination of the lungs does not reveal the multiple lesions of embolic bacteria.

- 3 Bacteriological examination of the sputum always shows the organisms of seasonal pulmonary infections.

For two and a half years the authors have experimented with preventive vaccines, giving daily doses for eight days before operation. As the immunity conferred by such vaccination is transitory, the operation must be performed within forty-eight hours after the last dose of vaccine is given.

The authors have used lysate vaccine therapy in 140 cases. In 21 cases in which a gastrectomy was done for ulcer there were 2 deaths, 1 from duodenal leakage one month after the operation and 1 that of a patient seventy-one years old. Two deaths occurred also in 42 cases in which a gastro-enterostomy was done, and 1 of these also was the death of a patient over seventy years of age. The operations in the other cases were cholecystectomies, hysterectomies, and intestinal operations.

KELLOGG SPEED, M.D.

## ANTISEPTIC SURGERY, TREATMENT OF WOUNDS AND INFECTIONS

Dalling, T, McEwen, A D, Robertson, M, Williams, B W, and Others Discussion on Bacillus Welchii Infections in Animals and in Man *Proc Roy Soc Med*, Lond, 1932, xxv, 807

DALLING The rôle played by the bacillus welchii in the diseases of domestic animals has always been open to doubt. In cattle, blackleg, the chief cause of which is the bacillus chauvazei, and in sheep, braxy, which is associated with the vibron septique, have been investigated in numerous studies. Some workers have reported the isolation of the bacillus welchii from the various lesions. Occasionally the bacillus welchii has been isolated also from material derived from cases of blackquarter. Primary infection of cattle with the bacillus welchii if it occurs, appears to be of little importance.

The bacillus welchii may be present normally in the intestine of any animal, but true bacillus welchii infection from the alimentary tract seems to occur only when the intestine is diseased. It seems reasonable to believe that if the bacillus welchii is present in a diseased intestine in which conditions are suitable for the elaboration of its toxin, a true bacillus welchii toxæmia may result.

Though the typical bacillus welchii may be isolated from sheep under normal and pathological conditions, it is probable that the organism resembling the bacillus welchii which causes specific diseases in sheep varies somewhat from the typical bacillus welchii.

McEWEN With the exception of diseases of alimentary origin such as lamb dysentery and "struck," domestic animals are rarely subject to infection by bacteria of the bacillus welchii type. Claims that the bacillus welchii caused gas gangrene in a domestic animal can be accepted only when the evidence rules out postmortem invasion and bacteriological data are sufficient to permit recognition of the bacterial species. There are few recorded cases meeting these requirements.

ROBERTSON The bacillus welchii organisms are distributed extremely widely and vary widely in their toxicity and infecting power. Their pathogenicity may be slight or so great that death may occur in eight hours from a fulminating gangrene set up in a wound which, in itself, is neither extensive nor serious.

The chief diseases produced by the bacillus welchii in man are gas gangrene with its variations and complications, acute intestinal conditions and puerperal sepsis.

The bacillus welchii group of organisms is composed of at least the following two large subgroups

1. Welch bacilli mostly of human origin, which differ among themselves in serological type as to their O-antigen, but produce one bacillus-welchii toxin.

2. Lamb-dysentery bacilli derived from sheep which also show variations in the O-antigen. While bound together within itself this subgroup is divided from the first subgroup by the more comprehensive, though related, character of its toxin.

The bacillus *parvulus* either forms a third subgroup or belongs to the second.

WILLIAMS. Bacillus welchii is responsible for an important part of the toxemia associated with acute intestinal obstruction and ileus. In these conditions it proliferates in the stagnant contents of the intestine and the absorption of the toxin gives rise to symptoms without material bacterial invasion of the tissues.

In man, bacillus welchii contamination nearly always results from the infection of a wound, accidental or operative with material containing the organism or its spores. On account of the wide distribution of the organism in dust, soil, milk, and feces, the contamination may occur under a great variety of circumstances.

The cases may be divided into four large groups (1) those in which the contamination is the result of accident or injury (2) those in which the infection

results from the contamination of a wound with intestinal contents, (3) cases of puerperal infection, which usually occurs after obstetrical interference following death of the child, and (4) cases in which the infection develops as a terminal condition in a patient dying from some other disease.

WATSON. In man, gas gangrene may occur in the most mysterious manner. It may develop in a casted limb without any break in the skin. It may appear also after certain operations such as cauterizations, simple cholecystectomy, appendectomy and tonsillectomy. Possible explanations of the method of infection in postoperative gangrene are: (1) that the organism entered the tissues from a neighboring focus, such as the appendix, gall bladder, or colon, which was opened during the operation, (2) that it was introduced from the skin or by instruments or outfit, and (3) that it was dormant in the tissues and activated by operative or other trauma.

NEAME. Bacillus welchii infection of the human eye is rare and usually due to trauma.

IVINS-KROWLES. Gas gangrene of the pregnant uterus is often associated with a dead fetus. It occasionally occurs after criminal abortion. Under such circumstances it is attributed to the introduction of particles of feces on the instruments employed.

SAMUEL KATZ, M.D.

# PHYSICO-CHEMICAL METHODS IN SURGERY

## ROENTGENOLOGY

Delherm, Thoyer-Rozat, Codet, and Fischold  
Kymography (La kymographie) *Presse méd*,  
Par, 1932, xl, 515

Heretofore it has been possible to register only a single phase of the movement of organs roentgenologically, but Stumpf has now devised a kymograph by means of which the movements of all organs, and particularly those of the heart and large blood vessels, can be registered on a single film. Use is made of a lead grating which allows the irradiation to pass only through a series of openings 0.5 mm broad and separated from each other by a space of 11.5 mm. This constitutes a diaphragm placed between the subject and the film. By moving the grating or the film to the extent of the interval between two openings the movements of the organ are registered on the plate. The plates are examined by means of a kymoscope which gives the illusion of movement.

The kymograph makes it possible to register systole and diastole on the same plate, to localize the apex of the heart exactly, to differentiate between the left auricle, the pulmonary artery, and the aorta, and to make a differential diagnosis between mediastinal opacities.

The authors describe the appearance of the normal heart and the findings in various pathological lesions. They state that the method has not yet been thoroughly tested and its use will require further collaboration between cardiologists and roentgenologists. AUDREY GOSS MORGAN, M.D.

Cignolini, P. Methods of Cardiac Kymography, Roentgen Cardiac Myography (Metodi e mete della chimografia cardiaca, roentgenmiografia cardiaca) *Radiol med*, 1932, xix, 401.

The author presents a method of simultaneously recording the contractions of numerous points on the cardiac outline on a moving film. The procedure consists in applying over the cardiac shadow a lead plate in which longitudinal apertures are so placed that they will record the motion of a point on the right auricle, the right border of the great vessels, the base of the left ventricle (including at times the left auricular appendage), and a point on the apex. There is also a space for recording fifths of a second.

By this method Cignolini obtains films which enable him to study the time relationship and amplitude of the contractions of the different parts of the heart chambers. He presents two films illustrating different types of heart block. He believes that the method described constitutes an important adjunct for the scientific and clinical study of cardiovascular disturbances. PETER A. ROSI, M.D.

Reisner, A. Grenz-Ray Therapy *Radiology*, 1932, xviii, 733

The author discusses the quality and quantity of the irradiation used in Grenz-ray therapy and the action and field of application of such irradiation. He states that good results have been obtained from this treatment in eczema and neurodermatoses, psoriasis, dilatation of superficial blood vessels, inflammations of the cornea, and certain tuberculous skin lesions. In carcinomatous skin lesions Grenz-ray therapy is contra-indicated. Attention is called to contradictory results obtained with this method by different workers in general and local conditions.

On the basis of the literature and his own experience with X-rays of a long wave length, Reisner draws the following conclusions:

1. The basis of successful Grenz-ray therapy is exact dosage.

2. For the treatment of superficial skin diseases Grenz-ray therapy constitutes a valuable addition to our armamentarium.

3. While the therapeutic effect is usually approximately the same as that of ordinary roentgen rays, it sometimes seems slightly superior.

4. The advantage of Grenz-ray therapy is due to the fact that the deeper layers of tissues are well protected and the therapeutic dose can apparently be administered without danger of immediate or delayed injury.

5. The value of general body exposures to the Grenz rays in the treatment of local disease is debatable.

6. Final judgment as to the effect of the Grenz rays on internal disease will require further investigations in a large number of cases.

7. Injuries following Grenz-ray therapy can apparently be avoided if very soft rays are used and if the dose administered is the smallest required for the therapeutic result. ADOLPH HARTUNG, M.D.

Glasser, O. The Physical Foundation of Grenz-Ray Therapy *Radiology*, 1932, xviii, 713

Grenz rays are very soft roentgen rays with a wave length of from 1 to 3 Ångström units. They are produced at from 6 to 10 kv. in special tubes which usually have windows of Lindemann glass. The author describes the various types of tubes and apparatus. A tube and transformer are now being manufactured in the United States.

Because of their long wave length, Grenz rays are absorbed to a considerable degree in the glass windows of the tube and in the air. Therefore their quality and quantity are determined best by direct measurement at their site of application. For this measurement, Glasser employs the absorption of



the rays expressed either in half value layers of aluminum or in r units per minute as determined by a small ionization chamber of gold beater's skin. The data should always be accompanied by a record of the kilovoltage, milliamperage, type of tube, target material, and the focal skin distance.

The absorption of Grenz rays in aluminum foil 0.125 mm. thick has been determined for different conditions. The half value layers were found to be between 0.04 and 0.05 mm. of aluminum. By means of charts worked out by the author the half-value layers of aluminum may be translated into half value layers of air water muscle, and various parts of the skin. The r units per minute were found to vary between 400 and 0.5. The threshold erythema dose is about 250 r units.

CHARLES H. HEACOCK, M.D.

Dorne, M., and Whitla, C.: The Treatment of Superficial Fungus Infections with the Long Wave Length Roentgen Rays (Grenz Rays): Further Observations. *Radiology* 95 April, 1937

A review of the rapidly accumulating literature on Grenz-ray therapy failed to reveal any concerted effort to use this treatment in superficial fungus

infections even though such infections are localized primarily in the epidermis and most of the irradiation of Grenz rays is absorbed by the epidermis and the upper layers of the dermis. Believing that if the Grenz rays offer any possibilities in dermatology fungus infections would reveal them, the authors undertook a thorough trial of Grenz ray therapy in such infections.

For practical purposes the fungi were divided into two groups, namely hyphomycetes and yeast like fungi. The treatment used by the authors is described in detail. It consisted essentially in the administration of a fraction of an erythema dose at weekly intervals.

The authors have previously reported thirty cases treated in this way. In this article they report twenty two more. The patients age and sex, the areas of involvement, the clinical diagnosis, the mycological findings, the treatment, and the clinical results are recorded in tables.

It was found that infections due to yeast-like fungi responded to the treatment quite uniformly, whereas infections of hyphomycotic origin showed very little if any improvement.

ADOLPH HARTMAN, M.D.

## MISCELLANEOUS

### CLINICAL ENTITIES—GENERAL PHYSIOLOGICAL CONDITIONS

Maddox, K. Renal Dwarfism *Med J Australia*, 1932, 1, 487

Renal dwarfism, which is called also "renal infantilism," "renal rickets," "renal nanism" and "renal pseudorickets," is a condition of children characterized by retardation of development which is often associated with bone deformities of the late rickets type and with symptoms of a uræmic nature due to a severe chronic renal insufficiency that is frequently of congenital origin.

The average age of onset is seven years. The first appearance of genu valgum is commonly between the ages of twelve and fourteen years. Of seventy-two patients whose cases are reviewed by the author, thirty-nine were males.

Polydipsia, which was present in forty of the seventy-two cases reviewed, is especially marked before the third year of age. Polyuria increases progressively. Development is retarded. The epiphyseal growth is slow, and the height of the body is reduced by the severe genu valgum. A slowing up of the process of bone deposition occurs as if the body were adapting its bulk to the diminished renal reserve. Intelligence is very fair. The expression is often surprisingly mature.

Pain in the knees was present in 5 per cent of the cases reviewed. It is probably caused by the abnormal ligamentous strain.

Symptoms of uræmia, such as anorexia, constipation, vomiting, and convulsions, usually occur. With the exception of dyspnoea and oliguria they may be present for many years before death.

After the age of puberty, infantilism in some degree, but never complete, is usually apparent.

In all cases of azotæmic nephritis pallor or dryness and wrinkling of the skin with absence of sweating are common.

Patchy and blotchy pigmentation, most evident on the face, was noted in seventeen of the cases reviewed.

Cardiovascular hypertrophy is a variable finding and seems to lag behind the other features of the syndrome. Changes occurring in the fundus of the eye are typical of renal retinitis in the adult.

The bone deformities include genu valgum, enlargement of the epiphyses, which is most evident in the wrists and ankles, changes in the skull (the fontanelles may remain open), changes in the thorax similar to those occurring in nutritional rickets, and, in very advanced cases malacia of the long bones.

The urine shows all of the features of a chronic nephritis.

The urea, total non-protein nitrogen, uric acid, and creatinin contents of the blood rise progressively as death approaches. Chlorides are retained. Lipæmia may occur and may be extreme. Marked acidosis is a constant finding. The phosphorus content of the blood is increased.

On account of the insidious onset of the condition an early diagnosis is difficult. Renal dwarfism must be distinguished from diabetes insipidus, juvenile diabetes mellitus, hereditary ectodermal dysplasia, and Addison's disease. Other causes of dwarfism are cretinism, achondroplasia, congenital heart disease, pancreatic disease, coeliac disease, osteogenesis imperfecta, and ateliosis.

The more carefully the history is studied the more evident it becomes that during infancy the patient suffered from some form of toxæmia capable of exerting an inhibiting effect on his mental and physical development.

The course of the condition is determined by the rate of advancement of the underlying nephritis and the degree to which compensation occurs. The strain of puberty is often manifested by a rapid increase in the bone changes. Death occurs with the greatest frequency in the second decade.

The general treatment indicated is the same as that for nephritis of any other type.

SAMUEL KAHN, M.D.

Snell, A. M. Chronic Steatorrhœa with Tetany. A Report of Two Cases. *Med Clin North Am*, 1932, 16, 1593.

The cases reported by the author were treated with a high calcium intake and parathormone. In one case viosterol was given in addition. The variations in the blood calcium and phosphorus in the latter case are shown in a table. The serum calcium was gradually increased and the patient made a good recovery. The other patient failed to respond to the treatment.

In conclusion the author states that the syndrome of steatorrhœa and tetany is apparently dependent on deficient absorption of fat, calcium, and vitamin D from the intestines. J. FRANK DOUGHTY, M.D.

Parker, R. C. The Races That Constitute the Group of Common Fibroblasts. I. The Effect of Blood Plasma. *J Exper M*, 1932, 16, 713.

Parker states that the ability of fibroblasts to mature and manifest their various potencies in any particular medium is inversely proportional to the growth energy which they exhibit in that medium. Fibroblasts having access to high concentrations of food substances do not mature, regardless of their origin or the age of the animal from which they were derived. They behave as embryonic cells.

Fibroblasts cultivated *in vitro* are potentially able to produce cells with the functional and structural properties commonly attributed to macrophages. This is true regardless of their origin or the length of time which has elapsed since their isolation from their origin.

Parker believes that the fibroblast and macrophage represent extreme functional and structural variations of the same cell type.

He states that the structural and functional characteristics displayed by fibroblasts *in vitro* seem to vary according to the origin of the cells and the changes which take place in the composition of the medium with the passage of time.

ELIZABETH C. JOHNSON

Knappey, L. W., and Prosser, F.: Agranulocytosis. Report of a Case, with Autopsy Observations. *Am J Dis Child* 1933 April, 947.

The authors report a case of primary idiopathic agranulocytosis in a child which supports the view that the disease is caused by an unorganized noxious agent acting on the bone marrow. No evidence of local infection could be demonstrated clinically before the granulocyte count fell so low as seriously to impair the body's defense against saprophytic organisms. During an alebolic remission of the disease a blood culture was negative even though the granulocyte count was gradually falling.

The only noxious influence that could be discovered in this case was exposure for a period of at least three weeks to the fumes given off by the flue of a gas-burning furnace. This exposure occurred more than twelve months prior to the appearance of the first symptoms attributable to the disease. A careful study of the history with questioning of the patient regarding the possibility of exposure to a chemical poison may throw more light on the etiology.

In the author's case, blood transfusion and oral hygiene were the only therapeutic measures that seemed of value.

All cases of agranulocytosis in children which have been reported to date proved fatal less than six months after the onset of the first symptoms. In children, symptomatic cases such as are occasionally found after a prolonged pyogenic infection or other chronic disease have a better prognosis than idiopathic cases. SANCHEZ KARR, M D

Waters, C. A., and Flier, W. B.: Agranulocytic Angina. Report of the Effects of Irradiation in Marked Leucopenic States. *Am J Roentgenol* 912, April, 794.

The term "agranulocytosis" is used to designate a condition in which the granular elements of the blood are lacking. On account of the severe lesions of the throat which usually accompany this blood dyscrasia Friedmann suggested in 1923 that the condition be called "angina agranulocytica." As a rule the disease occurs in middle-aged women. Be-

fore the use of roentgen therapy the mortality was reported as about 91 per cent. Since then, statistics have shown it to be 70 per cent. The clinical symptoms of the condition are weakness, fatigability, loss of strength, and exhaustion.

Most internists have used roentgen therapy in conjunction with blood transfusions, leucocyte extract, nucleoid and treatment of the oropharyngeal lesions. With the exception of Friedmann, none speaks with any degree of assurance regarding the effect of irradiation of the bone marrow. The authors' experimental findings seem to indicate that a transient stimulation may be expected after small doses of roentgen rays, but more work must be done and more reports of cases treated with the roentgen rays will be necessary before a very definite statement can be made regarding this type of treatment. However, there is no apparent contra-indication in the use of carefully measured small doses of the roentgen rays. The rise of the cell count in several animals manifesting local inflammation or infection during the marked leucopenic stage suggests the possibility that the production of an abscess might be beneficial in cases of moderately severe agranulocytosis. In one case, recovery was attributed to the laceration of sepsis due to the streptococcus *hemolyticus*. HOWARD A. MCKENZIE, M D

Soderck, P.: Trophic Disturbances of the Extremities from Periphereal Ischemia and Traumatic Irritation (Die trophische Parasthesien-leiden nach peripheren Ischämien und traumatischen Reizen). *Deutsche Zeitschr f Chir* 1935, 299-306.

Trophic disturbances of the extremities due to infections and traumatic irritations, usually referred to as "Soderck's atrophy of bone," are still often regarded incorrectly as an atrophy of haecthrity. All of the tissues of the affected extremity show changes. The skin is cyanotic and easily injured, the subcutaneous tissues are shrunken and poor in fat, and edema may frequently be demonstrated. The hair grows rapidly and as a rule the sweat glands are found to be hypertrophied. In the acute stages the muscles show a form of atrophy in which there is a rapid loss of strength with a decrease in the circumference of the limb and in the response to electrical stimulation which is quantitative, not qualitative. The most striking changes are the changes in the bones which are manifested in the roentgenogram as a spotty atrophy with heavy structural derange. The growing bone grows slowly both in length and thickness. The histological basis of the decreased ossification is a lacunar and vascular regression.

In the joints the capsules shrink and fibrous ankylosis often develops.

The composition of the blood in the affected extremity is altered serologically and morphologically. The cutaneous vessels show a diminished power of reaction. The numerous symptoms only develop rapidly. They vary a great deal both in number and severity depending upon the fatmesty of the limbs.

tive factor. The trophic disturbances may appear simply as an accompaniment of the irritation and disappear upon removal of the irritation. However, in the presence of a slight or unnoticed persisting irritation, they constitute a distinct syndrome.

Sudeck distinguishes three forms of trophic disturbances: (1) those which result from some intense exogenic, peripheral irritation, (2) neurotic disturbances, and (3) thrombotic disturbances. He gives his reasons for excluding these disturbances from those brought about by simple inactivity. He believes that the general causative factor lies in the qualitative blood alterations which are brought about by reflex processes or by paralysis of the vascular innervation. Simple quantitative changes in the blood supply lead to a simple quantitative atrophy (atrophy of inactivity, senile atrophy), but not to a true dystrophy. The processes engendered by the qualitative composition of the blood in the different forms of dystrophy of the extremity are described, in their incipency they may be regarded as a collateral inflammation. As a rule the rise or fall of the temperature of the skin distinguishes between the irritative form of trophic disturbance due to inflammatory hyperæmia and the permanent form of dystrophy of the extremity which is caused by a paralytic condition of the vessels. The changes in the nutrition of an extremity in the presence of peripheral irritation represent an attempt at healing, whereas the dystrophic disease signifies failure of this attempt. The treatment should be directed toward improving the general condition and increasing the power of reaction of the degenerated nervous system. The irritative process should be combated or removed.

F KLACES (Z)

Griffith, A. S. Human Tuberculosis of Bovine Origin. *Edinburgh M J*, 1932, xxxix, 177.

The author records the results of his studies of human tuberculosis of bovine origin in the British Isles. He has established the following facts:

The bovine type of tubercle bacillus can produce ulcerative pulmonary tuberculosis in the human subject which is indistinguishable from that caused by the common tubercle bacillus causing tuberculosis in man.

Pulmonary tuberculosis of bovine origin is more frequent in some parts of the country than in others. In Scotland and the northern counties of England its incidence is approximately 4.0 per cent, whereas in the south of England it is slightly less than 1.0 per cent. Bovine tubercle bacilli appear in the sputum more frequently in communities where they have frequent opportunity to enter the human body (as shown by the high frequency of bovine infection in children) than in communities where such opportunity is more restricted.

In the majority of the cases studied the tuberculous process in the lungs was secondary to an infection acquired in childhood through ingestion.

While there is evidence from the distribution of the lesions that children may be infected with bovine

bacilli by inhalation, there was no evidence in the cases studied that any of the phthisical adults had acquired the bovine bacilli from a previous case of phthisis or from tuberculous cattle directly by contact or through inhalation of infected dust in ship-pens or byres.

Bovine tubercle bacilli are conveyed to human beings through milk and its products and are restricted practically to one channel of entry, the alimentary tract. Their opportunities of invading man are greatest when milk is the chief article of diet. Hence bovine tubercle bacilli are found mainly in the tuberculosis of childhood and tuberculosis resulting from alimentary infection. The human tubercle bacillus, on the other hand, is more likely to be air-borne and thus to invade the human body chiefly by way of the respiratory tract. This type of bacillus is responsible for the great majority of the cases of primary intrathoracic tuberculosis. Pasteurization of milk, eradication of tuberculosis in cattle, and elimination of infected cattle for breeding purposes are suggested as the logical prophylactic means of eliminating human tuberculosis of bovine origin.

MANUEL E. LICHTENSTEIN, M.D.

Horsley, J. S. Certain Symbiotic Bacterial Infections Producing Gangrene, with Special Reference to the Principles of Treatment. *J Am M Ass*, 1932, xcvi, 1425.

Horsley reports three cases of progressive gangrenous ulceration of the abdominal wall which was due apparently to synergistic bacterial infection. In two of these cases the condition followed an abdominal operation and in one it occurred without any apparent primary wound. In one case the full thickness of the abdominal wall was involved. The first case of progressive gangrenous ulcer of the abdominal wall due to symbiotic and synergistic infection following a surgical operation was reported by Cullen in 1924.

In such ulcers the infection usually appears within from one to three weeks after an operation. The ulceration usually begins around a stitch or a stitch hole. The affected area becomes painful, swollen, and purple, and quickly ulcerates. The center of the ulceration is necrotic and extends in a serpiginous manner. The edges are usually elevated, and there is a distinct area of redness around the ulceration. The infection seemed limited to the skin, subcutaneous fat, and fascia, and does not attack the aponeurosis of the abdominal wall or the muscles.

According to Meleney, the ulceration seems to be due to a symbiotic synergistic infection by two types of bacteria, a streptococcus which is at first anaërobic, but later grows in the presence of oxygen, and a hæmolytic staphylococcus aureus. Meleney describes the streptococcus as a non-hæmolytic micro-aërophilic streptococcus which is frequently found in the human intestine and makes up a large percentage of the bacteria found in peritoneal exudates. In examinations of the tissues

Fibroblasts cultivated *in vitro* are potentially able to produce cells with the functional and structural properties commonly attributed to macrophages. This is true regardless of their origin or the length of time which has elapsed since their isolation from their origin.

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ELIZABETH CRADDOCK

Langley L. W., and Prosecher F. Agranulocytosis: Report of a Case, with Autopsy Observations. *Am. J. Dis. Child.* 92: 232, 947.

The authors report a case of primary idiopathic agranulocytosis in a child which supports the view that the disease is caused by an unorganized noxious agent acting on the bone marrow. No evidence of focal infection could be demonstrated clinically before the granulocyte count fell so low as seriously to impair the body's defense against saprophytic organisms. During an albedine remission of the disease a blood culture was negative even though the granulocyte count was gradually falling.

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SARVET KARY, M.D.

Waters, C. A. and Piror W. B. Agranulocytic Angina: Report of the Effects of Irradiation in Maryland Lymphocytic States. *Am. J. Roentgenol.* 92: 2071, 749.

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BOWMAN A. McKINNEY, M.D.

Sodeck, F.: Trophic Disturbances of the Extremities from Peripheral Infections and Traumatic Irritation. (*Die trophischen Extremitätenstörungen durch periphere Infektionen und traumatische Reize*). *Deutsche Archiv f. Clin. Med.* 1934, 193: 506.

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Horsley, J. S. Certain Symbiotic Bacterial Infections Producing Gangrene, with Special Reference to the Principles of Treatment. *J Am M* 455, 1932, xcvi, 1425

Horsley reports three cases of progressive gangrenous ulceration of the abdominal wall which was due apparently to synergistic bacterial infection. In two of these cases the condition followed an abdominal operation and in one it occurred without any apparent primary wound. In one case the full thickness of the abdominal wall was involved. The first case of progressive gangrenous ulcer of the abdominal wall due to symbiotic and synergistic infection following a surgical operation was reported by Cullen in 1924.

In such ulcers the infection usually appears within from one to three weeks after an operation. The ulceration usually begins around a stitch or a stitch hole. The affected area becomes painful, swollen, and purple, and quickly ulcerates. The center of the ulceration is necrotic and extends in a serpiginous manner. The edges are usually elevated, and there is a distinct area of redness around the ulceration. The infection seemed limited to the skin, subcutaneous fat, and fascia, and does not attack the aponeurosis of the abdominal wall or the muscles.

According to Meleney, the ulceration seems to be due to a symbiotic synergistic infection by two types of bacteria, a streptococcus which is at first anaerobic, but later grows in the presence of oxygen, and a hæmolytic staphylococcus aureus. Meleney describes the streptococcus as a non-hæmolytic micro-aerophilic streptococcus which is frequently found in the human intestine and makes up a large percentage of the bacteria found in peritoneal exudates. In examinations of the tissues

the streptococcus is found, in advance of the ulcer to the reddened area and a zone beyond it, while the mildly hemolytic staphylococcus aureus is found on the gangrenous margins of the ulcer.

The condition should be treated with the hot cautery. In no instance should the scalpel be used. If necessary the endotherm knife may be employed. The author believes it probable that recovery following cauterization of the wound is aided by the formation of an autogenous vaccine. He states that the relief of the pain in these lesions after cauterization is most striking. To prevent shock after such extensive cautery burns the intravenous administration of dextrose is indicated.

WILLIAM J. KNEZ, M.D.

Lockhart-Munro, J. P.: The Origin of Tumors. *Brit. M. J.* 1931, 1, 745.

The secret of tumor formation will be found in the study of normal tissue cells rather than in the study of tumor cells. Any theory of tumor genesis must be able to explain certain well-established facts. Every fact must fit into the theory. If it does not, it is not admissible or the theory is false and must be abandoned or modified.

The essential difference between a normal cell and a tumor cell is one of behavior, not of apparent structure. There are two kinds of reproduction—that which produces a new individual and that which results in the replacement of injured or worn-out cells in the tissues. All cells both germ cells and somatic cells, breed true to their parent cells, and this breeding is controlled by the genes in their nuclei.

Changes or mutations of the genes in the nuclei may occur and when they do the daughter cells will always breed true to the mutation. Tumors then are the result of a mutation of the genes controlling the division of somatic cells.

GEORGE A. COLLEY, M.D.

Pettit, V.: The Antagonism Between Malignant Tumors and Tuberculous (L. antagonism tra neoplastica maligna (tuberculosis) A. and di. *Arch. int. med.* 1931, 21, 140.

On the basis of an extensive review of the literature and observations of his own, Pettit concludes that cancer and tuberculosis are morbid processes of a different nature which occur at different ages and develop most frequently in different organs in persons of a different constitutional makeup. Sometimes, however, they may co-exist not only in the same organism, but also in the same organ. Tuberculosis may act as a chronic stimulus to neoplastic growth. When tuberculosis and cancer are found together the tuberculosis has usually preceded the cancer. Each lesion develops independently of the other. However the cancer may invade the tuberculous tissue. In so doing it seems to act as a stimulus to the tuberculous lesion. There are records of cases in which widespread metastasis of a malignant tumor was accompanied by the military dissemination of

tuberculosis. Tuberculosis undergoes no change in its virulence because of the presence of the cancer. Bacilli isolated from neoplastic tissues have produced typical lesions on inoculation. All of the evidence seems to disprove an antagonism between the two processes.

ROBERT T. LINT, M.D.

Bishop, E. L.: Melanoma in the Negro. *Am. J. Cancer* 1931, 21, 572.

In the negro the squamous and basal types of skin cancer are rare and melanoma is probably still less frequent. On the other hand the experience of the Steiner Clinic, Atlanta, Georgia, indicates that cancer of the breast and cancer of the cervix are just as frequent in negroes as in whites, the only difference being that cancer of the cervix is found more often in young colored women than in young white women.

In some cases of melanoma in negroes, the condition has begun in apparently normal skin, so known nevus having been present.

In the Emory University Division of the Grady Memorial Hospital, Atlanta, Georgia, a division limited to colored patients, 3 cases of melanoma were found in the period from October 1921, to June, 1931 in a total of 45,406 patients admitted. The total number of tumor cases was 665.

Of 5,663 pathological specimens examined in the laboratory of the Steiner Cancer Clinic, 70 were specimens of melanoma. Nine of the specimens of melanoma were from negro patients. The negroes varied in color some being light, some a darker brown, and a few almost black. Four died of the disease, 1 died of carcinoma of the cervix, 1 living after six months without evidence of the disease, and the remaining 3 cannot be traced. The tumor was on the foot in 4 cases, on the thigh in 2 and on the forehead, upper lip and eye in 1 case each.

CARR R. RITCHIE, M.D.

Seitzman, G.: Dermatitis and Pruritus: A Personal Experience from Tar in Men (Dermatitis e pruritus pruriginosus da catrinas polviformes). *Arch. int. med.* 1931, 22, 69.

Following a fairly complete review of the history of occupational skin lesions and the more important literature on the subject, the author reports and discusses a number of cases of skin lesions occurring in men working with tar pitch, and oil distillates.

About the head and neck he noted the following lesions—intense melanotic pigmentation, zones of atrophy and scarring, verrucous lesions, hyperkeratosis seborrheic, and melanotic hyperkeratosis. On the upper extremities the classical picture of a chronic tar dermatitis includes areas of atrophic skin next to scarring, hyperchromatic wine-red spots, lentiform skin with nodules and infiltration, hyperkeratotic flat papules, and warts.

The classical histological picture includes the combination of degeneration of collagen in the dermis, lymphocytic and plasma-cell infiltration, and epithelial proliferation. At no time did the

author note an exudative type of lesion or the regressive processes which ordinarily accompany infection. Occasionally pearl formation was seen in the areas of epithelial proliferation. These histological changes conform to those noted in animals treated with tar.

The author concludes that the changes in the dermis prepare the way for epithelial proliferation which may assume the characteristics of carcinoma. In spite of the histological appearance of carcinoma, this is at first clinically relatively benign. However, if it is allowed to remain long enough it may demonstrate all of the properties of a true active carcinoma.

A. LOUIS ROSE, M.D.

#### GENERAL BACTERIAL, PROTOZOAN, AND PARASITIC INFECTIONS

Thompson, L., and Beaver, D. C. Bacteræmia Due to Anaerobic Gram-Negative Organisms of the Genus *Bacteroides*. *Med Clin North Am*, 1932, 16, 1611.

The authors report two cases of bacteræmia due to anaerobic gram-negative organisms of the genus *bacteroides*. The clinical picture was similar to that of other severe bacteræmias. The condition was associated with embolic abscesses of the lungs and in one case with thrombophlebitis.

The reports of these cases are supplemented by experimental proof of the pathogenicity of the organisms, photomicrographs of some of the lesions, and a tabulation of previously reported cases.

J. FRANK DOUGHTY, M.D.

#### SURGICAL PATHOLOGY AND DIAGNOSIS

Grodinsky, M. The Sedimentation Test of the Blood in General Surgery, with Special Reference to Disease in the Lower Right Quadrant and to the Mechanisms Involved. *Arch Surg*, 1932, 95, 660.

The author reports the results of the sedimentation test of the blood and cell counts in various inflammatory and non-inflammatory pelvic conditions, diseases of the urinary tract, appendicitis, cholecystitis, cholelithiasis, and malignant and toxic conditions. His article and conclusions are summarized as follows:

1. The blood-sedimentation test is a simple and reliable means of diagnosis and prognosis in general surgical conditions, often surpassing the blood count in value.

2. It is of particular value in the differential diagnosis of appendicitis from other pathological conditions of the lower right quadrant of the abdomen.

3. There is an inverse relationship between the settling time of the erythrocytes and the viscosity of the plasma, which is best expressed by a graph.

4. It is suggested that variations in viscosity may be due to variations in the amount or form of the lipid content of the plasma.

5. On this basis a theory is offered to explain the variations in the sedimentation time, which embraces the electrical theory advanced by other investigators. However, the exact mechanism is still unknown and further work along this line seems indicated.

EMIL C. ROBITSHEK, M.D.



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NOTE—THE BOLD FACE FIGURES IN BRACKETS AT THE RIGHT OF A REFERENCE INDICATE THE PAGE OF THE ISSUE OF WHICH AN ABSTRACT OF THE ARTICLE REFERRED TO MAY BE FOUND.

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# INTERNATIONAL ABSTRACT OF SURGERY

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## COLLECTIVE REVIEW

### GASTRIC AND DUODENAL ULCER

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A REVIEW of the 1931 literature on gastro-duodenal ulceration shows that there is still a marked difference of opinion not only on surgical indications, but also on the type of surgical intervention. Many internists believe that surgical treatment is indicated only in absolute medical failures. However, differences of opinion as to what constitutes a medical failure make it difficult to know just when surgical treatment is advisable. Many surgeons are confident that most surgical failures are secondary to medical procrastination which permits the development of such extensive pathological changes that surgery must of necessity be palliative rather than corrective.

If the etiology and pathogenesis of gastro-duodenal ulceration were definitely established, much of this confusion could be eliminated. In 1931 these two important phases of this subject received little or no additional clarification. We are therefore compelled to resort to the type of therapy which promises the most satisfactory results with minimal morbidity and mortality. Were the results of any one type of treatment uniformly consistent, the problem would be relatively simple, but here again there is a marked divergence of opinion, as is demonstrated by the symposium on ulcer in 1930 of the American Surgical Association.

Balfour (1) reported the results of 500 gastro-enterostomies for duodenal ulcer which were evaluated after a minimum postoperative observation period of five years. Relief was afforded in 87 per cent of the cases which had not responded to other types of therapy. Of the failures in 13

per cent of the cases, many were secondary to causes not related to either the stomach or the duodenum. The poor results occurred in the patients with an average age of thirty-five and fifty-eight hundredths years. In those with an average age of forty-four and eight-tenths years the results were excellent and the total mortality for the five years was only 1.8 per cent. Forty-five of the 500 patients had one or more hemorrhages. In 1, the bleeding was fatal. Perforation or pyloric obstruction did not occur in this group.

Balfour reviewed also 100 cases of gastric ulcer in which gastro-enterostomy was done. He stated that he is convinced that gastro-enterostomy alone is the operation of choice when the size or situation of the lesion or the age or condition of the patient would make removal of the lesion difficult or hazardous. In the cases reviewed, the operative mortality was 3 per cent and after a five-year observation period none of the patients had experienced either a perforation or an obstruction. Seventy-nine per cent were relieved of their symptoms, 4 per cent had a fair result, and 17 per cent had a poor result. The outstanding fact demonstrated by these 100 cases is that "an indirect operation alone for gastric ulcer can be depended on to give a high percentage of good results in cases in which the removal of the lesion by any method is difficult and partial gastrectomy is associated with prohibitive operative risk and an unwarranted sacrifice of the stomach."

In a report on the results of operation for excision of ulcer of the duodenum Judd (37) stated that gastro-enterostomy will probably remain the

popular operation for duodenal ulcer. It is satisfactory in all cases except those in which secondary ulcers may develop and in those in which hemorrhage occurs. But with removal of the anterior pyloric sphincter everything is accomplished that gastro-enterostomy can accomplish and in addition the ulcer is removed. Gastro-enterostomy is particularly satisfactory for older patients, especially those with symptoms of obstruction. In younger patients its results are less satisfactory. In Judd's 1,363 cases of duodenal ulcer the result was the same as that obtained with gastro-enterostomy, being satisfactory in 90 per cent. Judd says that the local operation (removal of the anterior pylorus plus excision of the ulcer) can be performed in about 50 per cent of cases of duodenal ulcer and in these will give better immediate and ultimate results than gastro-enterostomy.

In general, Bloodgood (4) agrees with Judd that duodenal ulcer should be treated conservatively. He states that if local conditions permit, the Finney pyloroplasty with or without local excision of the ulcer is the operation of choice. When the Finney pyloroplasty is contra-indicated the choice rests between a short loop gastro-enterostomy and resection. Chronic ulcers of the duodenum which are adherent to the pancreas should be treated by partial gastric resection rather than by posterior gastro-enterostomy. Finney's pyloroplasty or any type of gastroduodenostomy with local resection of the ulcer may be carried too far.

An interesting contrast is made by the statistical reports of Horsley (34) on 78 cases operated upon in the period from 1909 to 1929 by physiological pyloroplasty, the operation in which physiological rest is given by division of the pyloric canal and sphincter plus excision of any ulcer that may be present in the first part of the duodenum. Forty-five per cent of the patients were relieved of symptoms and greatly benefited, 12 per cent were slightly benefited, 36 per cent obtained no benefit, 4 per cent are dead, and 4 per cent cannot be traced. Horsley believes that his physiological pyloroplasty is indicated in (1) cases of single small, well-defined ulcers in the first part of the duodenum in which there has been no medical response and there are no adhesions or adhesions only to the gall bladder, and (2) cases in which it is desired to obtain an easier outlet for the stomach, as after excision or cauterization of a gastric ulcer. Of 57 cases in which Horsley performed a gastro-enterostomy satisfactory results were obtained in 67 per cent. Eleven per cent of the patients were slightly benefited, 11

per cent received no benefit, and 22 per cent died. Horsley says that gastro-enterostomy has a large field in peptic ulcer and is indicated when: (1) the duodenal ulcer is large and extensive and adhesions are present, and (2) there is marked stenosis or inflammation and recurrent ulcer has developed after pyloroplasty.

Deaver (12) favored the extensive use of resection of the anterior half of the pyloric sphincter without opening into the lumen of the stomach or duodenum. He stated that this operation should be performed in (1) cases of peptic ulcer without organic pyloric obstruction, (2) cases of pylorospasm associated with other abdominal lesions, and (3) cases of hyperchlorhydria without an organic basis. Uncontrolled gastric acidity is assumed to be one of the chief causes of peptic ulcer. For a time, excessive secretion is controlled by the regurgitation of duodenal contents into the stomach (Bodleyruff's theory). Hyperacidity and hypersecretion in peptic ulcer are probably the result of exaggeration of the psychic phase of acid secretion with dysfunction of the pyloric sphincter interfering with duodenal regurgitation. The functional nervous disturbance is difficult or impossible to correct. Deaver and Berken expressed the belief that the control mechanism of duodenal regurgitation can be restored to normal by removal of the anterior half of the pyloric sphincter. With regard to 81 cases so treated during a period of two and a half years they said:

The results have been at least as satisfactory as from any operation we have used in similar cases insofar as symptomatic relief and post-operative X-ray findings are concerned. We have not yet encountered a recurrence of ulceration and, of course, the development of gastrojejunal ulcer is impossible. The removal of the anterior half of the pyloric sphincter is much simpler than gastro-enterostomy or resection of the stomach. Moreover, it gives equally good results and is followed by much less hazardous complications and late sequelae.

The surgical trend away from gastro-enterostomy toward pyloroplasty finds a physiological basis in the experimental evidence presented by Ivy (17). By various modifications of the "internal duodenal drainage" operation, Ivy has shown that, in dogs, the jejunal mucosa is much more sensitive to the irritating action of the gastric juice than the duodenal mucosa. Gastric retention and gastric hypertrophy secondary to pyloric stenosis are also found to be factors increasing the incidence of experimental ulcer.

Walton's (60) report on the surgical treatment of simple ulcers of the fundus of the stomach

must be given consideration because of the trend of radical surgery in lesions of this type. The surgical indications recognized by Walton are (1) severe pain indicating perforation, (2) severe or repeated mild hæmorrhages, and (3) gastric distortion — especially hourglass deformity — which suggests possible malignancy. In 59 cases with such indications which were treated by gastro-enterostomy there has been 1 recurrence. Walton believes that the value of resection in preventing carcinoma is exaggerated. Of 306 cases in which local excision was done without partial gastrectomy, a carcinoma developed at the site of the previous ulcer in only 1. None of the excised specimens revealed evidence of malignancy. As a general rule Walton advocates local resection and gastro-enterostomy since, of 224 cases treated by these methods and remaining under observation for five years, a cure was obtained in 88 per cent and recurrence developed in only 1.

It is interesting to note that Finney and Hanrahan (19), after thirty years of evaluation of the results of operations for chronic gastric and duodenal ulceration, have less confidence in surgical measures to effect a cure in cases of gastric and duodenal ulcer than in cases of other common non-malignant surgical lesions of the abdomen. In the period from 1900 to 1930, 734 cases of gastric and duodenal ulcer were operated on in the Johns Hopkins Hospital by 30 surgeons. In these cases there were 110 perforations and 627 chronic ulcers, of which 268 were gastric, 339 duodenal, and 20 marginal. The total mortality was 8.6 per cent. Eighty-three and nine-tenths per cent of the 330 patients with duodenal ulcer in this group who could be traced were benefited by the surgical treatment, whereas of 268 with gastric ulcer, 80.8 per cent were benefited.

Before the controversial surgical aspect of ulcer treatment is taken up, Brown's (7) medical results should be considered. Brown's criteria for surgical intervention are (1) cicatricial pyloric obstruction, (2) repeated hæmorrhage, and (3) a gastric ulcer which either fails to heal or recurs after adequate medical management. Of 1,130 medically treated cases of peptic ulcer observed for periods varying from two and a half to eighteen years, cure resulted in 49 per cent, marked improvement in 16 per cent, moderate improvement in 10 per cent, and failure in 20 per cent. These statistics suggest that two-thirds of all patients with ulcer are sufficiently relieved of their symptoms by medical treatment so that only 33 per cent require surgical intervention. According to the surgical results of Balfour, Judd, Bloodgood,

Deaver, and Walton, approximately 80 per cent of patients not benefited by medical treatment are completely relieved of their symptoms by conservative surgical treatment. This leaves but a small percentage who are not rendered symptom free by conservative treatment.

However, the problem is not as simple as these statistics might suggest. There are many able clinicians who question medical cures, and there is a large school of surgeons who have not been able to duplicate the results of the conservative surgeons. It is this difference in end-results that has led to the controversy on the subject of peptic ulcer treatment.

Maes (46) believes that although the medical treatment of peptic ulcer has a definite field, its results are not permanent in the majority of cases. He is very skeptical about medical cures. He attributes the failures of gastro-enterostomy to such causes as (1) performance of the operation on the suspicion of ulceration rather than in its actual presence, (2) technical errors, (3) inadequate pre-operative preparation, (4) failure to eliminate foci of infection and causative foci, (5) inadequate postoperative care, and (6) post-operative indiscretions. Gastro-enterostomy may fail also because the patient's susceptibility to ulcer and constitutional inferiority have not been given adequate consideration.

Wooden (63) believes that medical measures consistently retard the progress of gastroduodenal ulceration, but rarely eliminate the disease. The great majority of ulcer cases are chronic with definite pathological characteristics which tend toward the development of obstruction in 34 per cent and toward the occurrence of hæmorrhage in 40 per cent. Perforation occurs in 6 per cent of duodenal ulcers. In gastric ulcers there is a possibility of malignancy. Wooden asks "Have we under our care (ulcer medical treatment) a more comfortable patient but a sick individual, slave to forms and times of eating, drinking, sleeping, or defæcation while the sword of Damocles hangs over his or her pylorus?" In a series of 40 cases treated by excision and pyloroplasty there was no mortality. Of the cases presenting the complications of adhesions, stenosis, and "medical helplessness," gastro-enterostomy gave excellent results in 90 per cent.

"The X-ray has been of great value in preventing medical management from dieting patients to death and surgeons from operating on everything in sight." It is interesting to note that Wooden quotes Vallex (1853) "Must I now present a summary and rules? I think not—for this would be choosing to give an air of precision

to a subject which in the actual state of science cannot be had !

Surgeons of the radical school of gastroduodenal surgery represented by Finsterer von Haberer and Berg have been unable to duplicate the reported results of conservative surgery. They report failure in from 30 to 50 per cent of cases treated by gastro-enterostomy and give the incidence of gastro-jejunal ulceration as from 6 to 25 per cent. In fact, the results obtained from gastro-enterostomy by some of the Continental surgeons have been so disastrous that the operation itself has been referred to by Pribeum (53) as a disease. A pathological basis for more radical gastroduodenal surgery in peptic ulcer may be based on the histological findings of Konjetzky (40) who minutely studied freshly resected specimens of stomach and duodenum obtained from patients with gastric or duodenal ulcer. All of these specimens showed gastritis which was most marked in the pyloric antrum. Gastroduodenal inflammation was present irrespective of whether the ulcer was gastric or duodenal. This gastritis was most pronounced in the region of the pyloric glands. If the factor causing it were definitely known, the treatment would become simplified, but despite numerous theories, no one has yet given an adequate explanation of the inflammatory process. Konjetzky believes that ulceration is probably secondary to the gastroduodenitis because the mucosa affected by the acute or subacute gastritis nearly always shows superficial inflammatory defects (erosions) which are undoubtedly secondary to inflammation of the mucosa. Acute and chronic ulcers may develop from these inflammatory defects, as was demonstrated in the material studied, which showed all stages from erosion up to the first stage of chronic ulcer. Cases of duodenal ulceration were found in which chronic ulcer was absent and stages of gradual transition between inflammatory erosions and acute erosions were present. In none of these erosions was there evidence of the action of gastric juice or of a rôle played by anemic necrosis, hemorrhagic infarcts, epithelial necrosis, or superficial coagula.

From his histological studies, Konjetzky concludes that the first phases of ulcer formation have no relation to infarction; that gastroduodenal ulceration never develops in normal gastroduodenal mucosa, but always occurs on the basis of a previous gastritis or duodenitis and that gastroduodenitis must be considered the anatomical basis for typical chronic ulcer symptoms. He believes that the chief essential in the treatment of peptic ulcer is not neutralization of acidity by

alkalies, but relief of inflammatory changes of the mucosa and of the muscular obstruction resulting therefrom. The treatment of ulcer is therefore the treatment of gastritis especially in the early stages of the disease. In chronic phases of the disease a cure by medical measures is practically impossible.

Schultz (56) however, reported 30 specimens of ulcer in which he found one or more obstructive arterial lesions in the ulcer region. Arterial occlusion and ulcers seem to be always co-existing. Schultz found no arterial occlusion in the normal mucosa. In contrast to Konjetzky he concluded that the course or pathogenesis of gastroduodenal ulceration is determined by secondary arterial changes. These secondary changes penetrate the tissue surrounding the ulcer to form a zone which varies directly in width and severity with the size and age of the ulcer. The ulcer progresses largely as a result of the formation of small infarcts produced by secondary closure of capillaries in the floor of the ulcer. In a majority of patients with ulcer lesions capable of producing emboli evidence of arterial obliteration or infarction is found in other parts of the body. However, no evidence is presented to indicate whether these circulatory changes cause the ulcer or are secondary to it.

The radical school of gastroduodenal surgery, using Konjetzky's histological studies as a basis, decided that removal of the pathological tissue would give the best end-result. The reaction of the gastroduodenal segment varies from the relatively conservative operation of von Haberer, whose objective is removal of the area of pyloric glands, to the radical surgery of Finsterer and Hoffmeister. Von Haberer reported (56) that in over 5,000 cases treated by resection the incidence of cure was 95 per cent and the mortality below 5 per cent. Finsterer (50) reviewing his cases of ulcer, 316 duodenal and 90 gastric, stated that an excellent end-result was obtained in 93.95 per cent and the mortality was about 5.1 per cent. Berg (12) reported that in the period from 1923 to 1929 he performed 495 primary subtotal resections with excellent end-results and a mortality of only 7.90 per cent (corrected to 6.90 per cent). In 6 cases the ulcer recurred. Berg emphasized that prior to 1920, when he was treating gastroduodenal ulceration by the usual methods of ulcer excision, caustic puncture and pyloroplasty, he obtained a cure in only 50 per cent of the cases and a recurrence developed either at the gastro-enterostomy stoma or at the original site in 50 per cent. His unsatisfactory early results as contrasted with his excellent late

results from radical surgery are extremely interesting. The whole problem of gastroduodenal surgery presents the same contrast.

Lublin (45), reporting on the late symptoms following gastro-enterostomy and resection of the stomach for gastric and duodenal ulcer, reviewed the end-results in 98 cases operated on for gastric and duodenal ulcer in the medical clinics of the Serafimer Hospital, Stockholm, Sweden, during the ten-year period from 1919 to 1928. Eighty-seven cases were treated by gastro-enterostomy and 11 by resection. Cases in which cancer was suspected were not considered. The cases are classified as follows:

1. Peptic ulcer, jejunal ulcer, true and false recurrences (a) diagnosis verified by re-operation or autopsy, (b) diagnosis verified by definite roentgen findings.

2. Hæmatemesis, melæna, and complaints chiefly of a gastric character without a definitely demonstrable ulcer.

3. Complaints chiefly of an intestinal character.

4. Postoperative anæmia not caused by bleeding.

In 14 of these 98 cases operation was followed by gastrojejunal ulcer. The occurrence of this lesion at varying ages gave the impression that the age at which the primary operation is performed is not of decisive importance in the formation of a subsequent ulcer. In no fewer than 4 cases the operative findings at the primary operation were stated to be negative.

Hæmatemesis, melæna, and complaints chiefly of a gastric character without any definitely demonstrable ulcer were present in 55 cases. Nine of these cases were treated by a Billroth II operation, and 46 by gastro-enterostomy. It was interesting to note that hyperacidity was not a factor in the symptoms. Roentgen examination showed that in most of the cases there was no relationship between the emptying capacity of the stomach early in the examination and the capacity of the stomach to empty itself completely.

Twenty of the 98 patients complained of intestinal symptoms. In 18 of the 20 these symptoms followed a simple gastro-enterostomy. Undoubtedly most of them were secondary to faulty digestion, the "intestinal fermentation dyspepsia" of Zweig. Two-thirds or 43 patients in the group of 98 showed a mild hæmorrhagic anæmia of unknown etiology. The hypothesis that this may be explained by a physiological disturbance of the digestive organs secondary to the operation is somewhat substantiated by the fact that exclu-

sion of the pylorus seems to eliminate the tendency toward anæmia. Surgeons who believe that gastro-enterostomy decreases gastric acidity will find little support for their opinion in this series of patients in whom there was no marked postoperative reduction of acidity. The postoperative acidity varied not only from case to case, but also, within a relatively brief space of time, in one and the same case.

Despite the fact that the majority of surgeons treat perforation by simple closure, Blackford (3) found that simple closure gave a satisfactory end-result in only 66 per cent of 269 cases whereas closure plus gastro-enterostomy increased the incidence of good end-results to 83 per cent. However, the treatment of this acute type of lesion is far from standardized. Von Haberer reported that in the cases of patients who are able to tolerate radical surgical intervention he and his assistants obtain the most satisfactory permanent results from resection.

The treatment of acute hæmorrhage varies from the conservatism in which operation is delayed until bleeding stops to the prompt surgical intervention of Finsterer.

In the treatment of gastroduodenal hæmorrhage, Pauchet (50) prefers waiting until the bleeding stops before he excises the gastric or duodenal lesion causing the hæmorrhage. He disapproves of gastro-enterostomies, cauterization, and pursestringing, being sure that these procedures do not control hæmorrhage. The only treatment is resection of the pathological tissue. He maintains that death in cases of hæmorrhage is due, not to shock or the bleeding, but to the absorption of toxic, partially digested proteins from the bowel. The bowel must be emptied through a cæcal fistula and lavaged with 100 liters of hot water containing sodium chloride for from nine to ten hours. The toxic, infectious colon content is thus emptied through the cæcum.

This diversity of opinion on the treatment of gastroduodenal ulceration is not limited to the surgical aspect. During the last few years Chianello (8) and Viviani (59) have studied the effects of roentgen-ray treatment on gastric secretion. Chianello found that after roentgen-ray therapy at the level of the sixth, seventh, and eighth dorsal vertebræ a marked increase in free hydrochloric acid secretion occurred in the majority of his patients whereas the pepsin index and the total acidity remained unchanged. In all patients the epigastric pain and subjective feeling of acidity ceased after the first or second irradiation. Although other investigators found a decrease in acid secretion, Chianello found an



increase. As in both cases the pain was greatly relieved Chianello concludes that pain and acidity are not etiologically related and that the effect of irradiation must be due to a direct action of the roentgen rays on the sympathetic nervous system.

Mitkin (51) has devised a new treatment for peptic ulcer which consists of the intravenous injection of foreign proteins derived from non-pathogenic achilomycetes together with lipoids, animal fats, and emetin. Seventy-six of a group of 127 patients were relieved of pain after the first injection and 16 after the second. Four received no relief. Improvement was demonstrated by X-ray examination as well as by gastric analysis.

During the past five years Glazner (24) has treated 400 cases of gastric, duodenal, or jejunal ulcer by subcutaneous or intramuscular injections of pepsin. Each patient receives 20 injections. Beginning with 0.2 c.c.m., the dose is increased weekly until 0.5 c.c.m. is injected and then is gradually reduced to 0.2 c.c.m. Satisfactory subjective and objective results have been obtained in 66 per cent of the cases. Recurrences are treated by repeating the course of 20 injections.

Autohemotherapy was used by Hubert (56) in the treatment of duodenal ulcer. One cubic centimeter of blood was injected intramuscularly and the dosage increased 1 c.c.m. daily until the dose per day was from 10 to 12 c.c.m. Good clinical results were obtained from this type of therapy.

Fogelson (51) treated peptic ulcer with gastric mucus prepared from hog-stomach linings. His preliminary reports suggest a new form of physiological therapy which may be of some value. In a series of 68 cases, 14 of which had failed to respond to surgical gastroduodenal intervention, there were only 2 failures and no recurrences. The average patient was relieved of all subjective symptoms within one week.

Leriche and Fontaine (43) suggested to the French Congress of Surgeons that mucus may play an important rôle in gastro-intestinal physiology and may be of importance in the ulcer problem. However as little is known about the chemistry and physiology of mucus, they believed their observations to be of very little practical value. Fontaine is conducting further studies on the rôle of mucus in gastroduodenal ulceration.

Crile's (10) treatment of peptic ulcer by denervation of the adrenal glands and partial thyroidectomy is based upon the belief that personality and temperament are the products of interactivity of the nervous system, thyroid, and

adrenal glands. Increased acidity is found in hyperthyroidism and low acidity or anacidity in myxedema. In the winter greater thyroid activity is associated with exacerbation of peptic ulcer symptoms, showing that the thyroid gland has the power of controlling gastric acidity. The activity of the thyroid gland and of peptic ulcer is increased also by infections. In his experimental work Crile found that

1. Excessive thyroid feeding increases the total quantity of gastric juice, free and combined acids, and mucus.

2. After excision of sufficient thyroid to cause myxedema the gastric acidity is low or anacidity is present.

3. The administration of food to dogs in which hyperthyroidism has been induced causes unusual high acidity.

4. The administration of food to myxedematous dogs is followed by either a subnormal increase in acidity or no increase.

Hyperthyroidism causes hypermotility and hyperperistalsis. After thyroidectomy the motility and peristalsis return to normal. The thyroid itself does not initiate the increased activity. The stimulation comes through the sympathetic nervous system, and the most powerful control of the sympathetic system is in the adrenal glands. It may be supposed therefore that if the adrenal factor were controlled the thyroid would remain inactive to a certain degree. Accordingly it would follow that division of the nerve supply of the adrenals on both sides should lead to an immediate alleviation of gastroduodenal symptoms. Adrenal denervation would not only lessen the activity of the thyroid but would also diminish pylorospasm. Crile reserves this denervation operation for peptic ulcer cases in which he believes recurrences would ensue after any operation, and for cases in which a Finney pyloroplasty or gastro-enterostomy is inadvisable. Denervation should not be attempted until non-operative treatment has educated the patient to proper ulcer behavior. "Then denervation will result in fundamental improvement, which, when supplemented by management, will give relief." Denervation gives prompt relief of symptoms, but will be followed by recurrence if postoperative care is neglected.

Hernando (27) has noted gastro-intestinal changes in patients with diseases of the endocrine system. In most cases of hyperthyroidism he has found achlorhydria or hypochlorhydria, although in a few he has demonstrated hyperchlorhydria. Addison's disease is usually associated with nausea, emesis, gastric pain and diarrhea.

alternating with constipation. Hernando has found gastric and duodenal ulceration associated with Addison's disease, and has produced gastric and duodenal ulceration experimentally by extirpating the adrenals.

A bacteriological and clinical study of gastric ulcer by Saunders (55) demonstrated a specific streptococcus in 19 specimens of resected gastroduodenal and gastrojejunal ulcers. The specificity was determined by cultural test, agglutination, cross agglutination, and agglutinin absorption. This strain of streptococcus has the same agglutinogenic and anti-agglutinogenic identity as similar strains of streptococci which produced mucous membrane or skin ulcers. The blood of persons with gastric ulcer contains specific agglutinins for this strain of streptococcus but not for streptococci of other types. As the virulent form of this streptococcus does not grow in bile, Saunders believes that surgical procedures which return bile to the ulcer-bearing area will give the best clinical results.

When Fauley and Ivy (17) injected streptococci isolated by the Rosenow technique from 2 gastric ulcers into pyloric antrum pouches of dogs, there resulted only local areas of oedema and congestion which disappeared within three days.

The importance of this type of investigation in the solution of the ulcer problem is apparent because some surgeons justify extensive resection on the basis of removal of the streptococcus-infected gastroduodenal segment. However, Konjetzny does not believe that the inflammation he has described in such detail has an infectious basis.

Studies on basal secretion in man by Pollard and Bloomfield (52) show marked variation. Many patients secrete an acid-pepsin gastric juice without any stimulation. Much can be learned of an individual's gastric secretion by repeated aspiration of the gastric contents. It is interesting to note that most subjects yield higher acid values without than with test meals or other stimulation.

Hollander's (33) experimental studies supporting the Heidenheim-Pavlov theory of constancy of acidity of the parietal secretions as evidence refuting the Roseman theory of hydrochloric acid formation is extremely interesting. Hollander found that if mucus is washed out of a Pavlov pouch and the pouch is not irritated by a metal catheter, the fluid collected consists of parietal secretions of *unchanging acidity*. This constancy of acidity is maintained until the rate of secretion falls to a level below the initial rate, i.e., until the flow of mucus and pepsin in proportion to the

flow of hydrochloric acid becomes large enough to be a significant factor. On the other hand, if experimental conditions are such that the flow of mucus throughout the experiment is fairly large, the terminal acidity will fall.

An important contribution on the activation of different elements of gastric secretion by variation of vagal stimulation is reported by Vaneberg (58) of Babkin's clinic. It was found that a strong induction current provokes the secretion of gastric juice with a very high digestive power, high acidity, normal content of chlorine, and small amount of mucus. A weak induction current applied to the vagi stimulates a flow of mucus having a high digestive power. The chief source of the mucus is the mucous membrane of the fundus.

Gilman and Cowgill (23) report on the osmotic relations of blood and glandular secretion and the regulatory action of the total blood electrolytes on the concentration of gastric chlorides. When the electrolyte content of the blood is increased there is a parallel increase in the total ionic content of the gastric juice. The chloride ion represents practically all the anion of the gastric juice, a fact suggesting that the chloride concentration of gastric secretion is regulated by osmotic pressure of the blood in general. An increase in the osmotic pressure of the blood should bring about a corresponding increase in the osmotic pressure of gastric secretion. This supposition was confirmed by injecting glucose intravenously. Even though glucose is a non-electrolyte, it increased the osmotic pressure of the blood and led to an increased secretion of gastric chlorides.

An explanation for duodenal ulcers found after extensive burns may be supplied by the experimental work of Hueper (29), who found that when rats are exposed to temperatures varying from 40 to 41 degrees C the pH of the duodenal contents becomes higher and there is a marked increase in the number of bacteria present in the duodenal contents due to invasion of colonic bacteria into the duodenum. Histological examination of the duodenum of these heat-exposed rats shows epithelial destruction with an occasional superficial ulcer. The mucosa and submucosa are hyperæmic, and there is a marked lymphatic and leucocytic infiltration.

In a study of the pathophysiology of hunger pains by Christensen (9) the relationship generally assumed to exist between hunger sensations and contractions of the empty stomach was not found in normal controls. The contractions were stopped by sufficient gastric contents, there being no relation between the different phases of hunger

contractions and variations in acidity of the gastric contents. In 16 patients with peptic ulcer however there was a distinct relationship between hunger pains and vigorous contractions of the empty or nearly empty stomach. Pain was present when the contractions were no more vigorous than those observed in normal persons. The pain was relieved by food or by any adequate stomach content which substituted rest for the vigorous gastric contractions. This adequate stomach content may be acid alkali, food or ingested gastric secretions. Gastric acidity bears no relationship to the varying capacity of the vigorous contractions of the stomach to produce gastralgia.

## SUMMARY

Although many valuable contributions to the peptic ulcer problem have been made in the last few years, the proper treatment for lesions which do not respond to medical therapy is still the subject of controversy. Lahey's (43) philosophic opinion, which makes concessions both to the internists and to the surgeons, seems to be a fitting conclusion. Any unprejudiced person must admit that a patient who has had an ulcer whether operated on or not, is always a possible candidate for another ulcer and that those patients who have been submitted to surgical procedures for ulcer no matter what the type, are less likely to have recurrent ulcers and more likely to have better end-results when placed on just as careful postoperative medical treatment as if they had not been operated on, and when urged to modify their habits of life just as much as they would if placed on non-operative medical management.

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# ABSTRACTS OF CURRENT LITERATURE

## SURGERY OF THE HEAD AND NECK

### HEAD

Bordoški, M. A Spontaneous Endemic Disease of the Face Produced by Gas Bacteria (Spontane endemische Erkrankung am Gesicht hervorgerufen durch Gasbakterien) *Med Pregl*, 1931, vi, 255

The author reports upon a previously unrecognized disease of the face which he observed in a field hospital during the world war. He saw twelve or thirteen cases of the condition, but is able to give exact data for only seven. The appearance of four of the patients is shown by photographs. Nearly all of the patients were of robust build. One had a phlegmon of the right thigh from a shrapnel wound. The others were entirely free from wounds and other injuries. At first, all suffered from headaches at night and swelling and fever of the affected side of the face. All except one had chills and fever. In four, the fever lasted for three or four days. In all except one the swelling first appeared on only one side of the face. It spread upward to the zygomatic arch and onto the eyelids, which became especially involved. In one case an odorless gas escaped when small incisions were made through the skin of the face and the pain then ceased. There were no symptoms of inflammation. The lymph glands were neither enlarged nor sensitive to the touch. In every case the face was pale. The nose, lips, and chin were never involved.

On palpation, crepitation was noted under the skin. The swelling extended backward and downward to the border of the mandible. When the cervical region was involved the swelling was between the submental region, the larynx, the posterior border of the sternocleidomastoid and the omohyoid muscle. The submental and laryngeal areas remained free from swelling for a distance of a fingerbreadth from the midline. The jugular and supraclavicular fossae were always swollen, and in two cases the subcutaneous emphysema extended downward over the chest wall to the nipples. The mucosa of the mouth was oedematous, showing the marks of the teeth, but in no instance were the teeth defective. The tongue was always moist. In seven cases dirty gray irregular lesions the size of hemp seeds which had inflamed margins and infiltrations of blood in the neighboring regions were observed in the retromolar triangle (Braun). When the facial oedema was bilateral they were present on both sides. Mastication was painful. These changes in the buccal mucosa lasted for three weeks and then disappeared without treatment. The fact that the oedema and crepitation persisted longest over

the angle of the mandible is regarded by the author as evidence that this area was the primary focus of the disease. In three cases small transparent blisters surrounded by reddened mucosa and forming a ring with a diameter of about 2 cm were found below or behind Stenson's duct. When these ruptured, confluent dirty gray ulcers remained. In one case similar blisters were seen on the unaffected side under normal mucosa. The author attributes the blisters to rubbing between the teeth and an accessory parotid gland in the swollen tissues. In one case with bilateral swelling of the face there was dyspnoea with respiration of from 50 to 60 and a pulse of from 100 to 120. The patient complained of pains and paræsthesia of the upper extremities and chest weakness, and thirst. In a case in which the facial disease was unilateral but the cervical region and chest were swollen on both sides there was diarrhoea with marked flatulence. In one case there was marked sweating of the affected side of the face.

Bacteriological studies were negative in every case except one. In the one exception, a strongly gas-forming odorless culture was obtained, but even in this instance there were no positive microscopic findings.

The author concludes that these cases were examples of a benign gas phlegmon in which the infecting agent entered through the buccal mucosa. He believes that the infecting agent was in the food which during the war was constantly in close contact with the ground. DERKAČ (O)

Dew, H., and Miller, D. Fibrocystic Epitheliomata of the Jaw. *Australian & New Zealand J Surg*, 1932, 1, 343

After reviewing the literature on fibrocystic epitheliomata of the jaw the authors report a number of cases which were treated surgically. According to Malassez, the tumors arise from parodontal debris. On the basis of the histological picture, Ewing distinguishes three types of tumors (1) acanthomata, (2) plexiform epitheliomata, and (3) glandular adamantinomata.

JOHN H. GARLOCK, M.D.

### EYE

McAndrews, L. F. Chemical Burns of the Eye. *Arch Ophth*, 1932, vii, 779

Chemical burns of the eye are always serious. In ammonia burns the condition of the eye may appear favorable immediately after the injury, but within from six to ten days the cornea begins to melt and

panophthalmitis develops. The damage in burns of this type is due to the formation of a very toxic soluble alkali albuminate.

Arids precipitate the albumin of the tissues and cause the formation of dense scars.

In lime burns, the chemical action is due to the formation of calcium albuminate and calcium carbonate, and the increase in the opacity is caused by an incrustation of calcium carbonate.

VICTOR W. WILSON, M.D.

Abraham, S. V.: Myasthenia Gravis. New Diagnostic Eye Findings with Possible Pathological Significance. *Arch. Ophth.* 33, vii, 700.

The author presents experimental evidence which led him to conclude that myasthenia gravis is not a true myasthenia. He examined routinely about 1,000 patients, including 6 with epilepsy 17 with chorea, 6 with paralytic agitates, 1 with encephalitis with ocular crises, 1 with epilepsy after acute encephalitis, 19 with multiple sclerosis, 3 with progressive muscular atrophy 1 with muscular atrophy 1 with periductal anemias, about 20 with myasthenia of the nervous system and 8 with myasthenia gravis.

The examination consisted of repeated tests for the phorias plus fusions with rapid interchanging. In the 8 cases of myasthenia the phorias did not remain constant, even hyperphorias changing from 2 to 30 degrees and from right to left in a way not seen in any other disease. Moreover the position assumed by the eyes during these tests and the large amount of fusions possible suggested that the disease is due not to tiring of the muscle as its name implies, but to a lack of proper return of the muscle. The author states that, if the double innervation theory is correct, this must be due to a disorder of the vegetative nervous system.

TERESA D. ALLEN, M.D.

Bietli, G.: A Melanocarcinoma of the Eyeball and Orbit Arising from the Pigmented Epithelium (Ueber ein vom pigmentierten Augenhautmelanocarcinom des Bulbus und der Orbita). *Klin. Monatsheft f. Augenheilk.* 93 (1930), 459.

Bietli reviews from the literature seven cases of pigmented, and two cases of non-pigmented, epithelial tumors of the iris, one case of peculiar floating cancer of the posterior layer of the iris (of Hirschberg and Hirschbach) cases of benign tumors, adenomas, papillomas, endotheliomas, benign epithelial tumors and malignant tumors of the ciliary epithelium (Fuchs) dyscycloplasms, which are very similar to gliomas and tumors, often with very malignant course which arise from the ciliary epithelium or the pigmented epithelium of the retina or both. After this review he reports an observation of his own.

His patient was a man sixty-five years old who was referred to the clinic with the diagnosis of perforated choroidal sarcoma of the left eye. The tumor had given rise to its earliest subjective symptoms five years previously. had led to rapid dislocation of

vision, and had finally caused swelling and former shape of the eye. It was the size of a walnut, a nodular grayish-black, ulcerated growth which protruded between the lids. At the angle of the lower jaw on the left side a gland the size of a pigeon's egg was found. The accessory sinuses were free. Enucleation of the eye with extirpation of the gland was done. Two months later metastases began to appear in the liver and spinal cord, and five months later the patient died. Autopsy was not performed.

Histological examination showed remarkable variety in the tumor. In some areas it resembled carcinoma sarcomatodes as the cells were similar to those of melanocarcinoma and yet had an epithelial character forming alveolar-like groups similar to those in alveolar carcinomas. On the other hand, considerable active involvement of the retina was manifested by the formation of an ectodermal framework of Moeller's supporting fibers from the Henle's membranes as well as the glial substance. The pigmented epithelium of the retina, but more especially of the ciliary retina and perhaps also of the iris portion, was involved in the proliferation. Xanthomas was found always in pigment-free cells still within the pigmented tumor masses. The glands showed only here and there large, heavily pigmented epithelial cells with a tendency toward tubular formation which corresponded to the cells of the main tumor. The tumor was called a melanocarcinoma of the pigmented epithelium because of (1) its malignancy and considerable local destructive growth, (2) the newly formed connective tissue stroma between the non-plastic cells, corresponding to that in other carcinomas, and (3) the large amount of pigment present in the neoplasia.

F. WATKINS (Ill.).

Mickovic, V.: Trachoma and Blindness in the Former Banat District of Western Siberia (Trachom und Blindheit in dem ehemaligen Banatbezirk von Westsibirien). *Arch. Ophth.* 91, viii, 374.

The Banat district is a large region inhabited by half a million people. It contains 9 districts and 3 cities. The population is made up of Russians, Cossacks (Tchuvash), Poles, Germans, and Letts. The region is 1,600 km. across, and the average district of physicians is from 60 to 80 km.

Up to 1917 the district had not been surveyed with regard to trachoma. In 1918 Mickovic examined 1,488 persons from a few villages in the Novo-Troitsky district and found 1,036 (4.1 per cent) of them afflicted with trachoma. This high incidence of trachoma is explained by the epidemic character of the disease among the Cossacks who constitute the greater number of the inhabitants of the region. Of the 1,150 Cossacks examined, 809 (69 per cent) were trachomatous, while of the Russians, only 6.9 per cent were affected. In some of the Cossack villages from 90.5 to 92.8 per cent of the inhabitants were found to be trachomatous. In some families practically every member was

affected with the disease (Čuwasch, 29.7 per cent, Russians, 1.2 per cent). However, even these families included individuals who remained free from the condition. The condition tended to occur in adults more frequently than in children.

In order to study trachoma further in this district, an eye clinic was established in the Nizhne-Kargatsky circuit during 1920. Here, 1,598 cases of primary and 598 cases of secondary eye affections were examined. Among these, trachoma was found in 990 (61.9 per cent). In 120 cases of trachoma operative treatment was given. Of 11,099 patients admitted from 6 other circuits for examination, 42 per cent were trachomatous. Of 8,727 school children examined, 1,029 were affected with trachoma. The incidence of the condition in school children averaged 11.6 per cent, but varied in the different circuits from 1.8 to 39.5 per cent.

The author studied also the data of the eye department of the district hospital for the years 1927 and 1928. Of the 2,616 patients, 26.4 per cent were trachomatous. Of those between the ages of one and fifteen years, Trachoma I was found in 82.3 per cent and Trachoma II and III in 17 per cent. Trachoma III occurred chiefly in those over thirty years of age. Trachoma was found even in nurslings. In 50.1 per cent of the cases of trachoma complications were present. The most frequent complications were pannus, which was found in 25 per cent, and entropion with trichiasis, which was found in 10.3 per cent. Trachoma III was complicated most frequently by pannus, entropion, and xerophthalmos, and Trachoma II, by pannus and ulcer of the cornea. Four hundred and three operations and 646 operative manipulations were carried out.

In 1928 Mickevič examined the school children in the city of Kainsk. Of 1,007 children, 49 (4.9 per cent) had trachoma. The greater number belonged to the Tartar and Čuwasch races. The author discusses also the incidence of blindness in this district. The incidence of incurable blindness in all cases of eye disease varied in the different circuits from 0.3 to 3 per cent. Fifty-three and three-tenths per cent of all cases of blindness were due to trachoma, 20 per cent to smallpox, 13.5 per cent to trauma, and 6.6 per cent to syphilis. Three-fourths of all blind persons were more than forty years of age. Blindness was  $2\frac{1}{2}$  times more common in women than in men. The coefficient of blindness in the total population was 30 among the Russians and 94 among the Čuwasch.

On the basis of these studies Mickevič comes to the following conclusions:

1. In the large Barabinsk region the incidence of trachoma is high. In the greater number of circuits the cases are widely distributed, but in some of the villages they appear to be concentrated locally.

2. The great extent of the Barabinsk area, the diversity of races inhabiting it and the great number of immigrants render the fight against trachoma, and particularly against blindness, very difficult.

3. The data obtained from clinics and from examinations of school children and persons selected indiscriminately from the general population give a good idea of the geographic distribution of trachoma in this region.

4. The ophthalmological service to these people may be improved by the establishment of an eye department in the circuit hospitals with an ophthalmological specialist for each circuit.

5. In the cities of the district it would be very advantageous to organize intercircuit hospitals with sections for all specialties on the order of an out-patient dispensary.

G. D. POLJAK (O)

Appelmans, M. An Experimental Contribution to the Study of Subconjunctival Tuberculosis of the Eye (Contribution expérimental à l'étude de la tuberculose oculaire sous-conjunctivale). *Re. belge d. sc. méd.*, 1932, **11**, 177.

The author reports experiments on rabbits in which subconjunctival tuberculosis was brought about by inoculation with a solution of human tubercle bacilli. Rabbits were used instead of guinea pigs because rabbit tuberculosis is more like human tuberculosis.

When an undiluted solution of the bacilli was used, the animals died before local lesions developed. When a 1:100 or 1:1,000 solution was employed, typical subconjunctival tubercles were produced. The tubercles produced by the 1:1,000 solution were fewer and did not persist so long as those produced by the 1:100 solution. Dilutions of more than 1:1,000 were inconstant in their results. In the author's opinion this fact explains why Blanc and Caminopetros reported that subconjunctival tuberculosis cannot be produced in the rabbit. The subconjunctival tubercles generally heal spontaneously.

The effect of radium on this ocular tuberculosis was also studied. Flemming and Kruzis reported that radium has a good effect on subconjunctival tuberculosis, but the author found that it had no effect either when a single erythema dose was given in an hour or several fractional doses of ten minutes each were administered, and that when it was applied for two hours continuously it sometimes caused abscess and fistula.

AUDREY GOSS MORGAN, M.D.

Wilson, R. P. Ophthalmia Aegyptiaca. *Am. J. Ophth.*, 1932, **21**, 397.

The author describes trachoma and some of the closely related infections, Morax-Axenfeld conjunctivitis, Kochs-Weeks conjunctivitis, and gonorrhoeal conjunctivitis.

He believes that the trachoma seen in Egypt is an infectious disease *sui generis*, the development of which is not dependent upon a preceding infection of a different type. He concludes, however, that the trachoma virus flourishes more readily on an unhealthy conjunctiva, and that therefore other infections probably favor its spread. Infections and irritation of the eye from dust, wind, and glare are common in Egypt.

Following a description of the various stages in the development of trachoma, Wilson shows the appearance of the lesion by illustrations in color and describes the histological picture.

THOMAS D. KELER, M.D.

Mayer, L. L.: Detachment of the Retina and Its Surgical Therapy. An Experimental Study. *Arch. Ophth.*, 1932, vii, 499.

Mayer describes his technique for producing mechanical detachment of the retina in rabbits and reviews the microscopic changes taking place after the use of various methods of cauterization on normal rabbit eyes and those in which detachment of the retina has been produced. He draws the following conclusions:

1. This study suggests that the retinal tear or hole is not the only factor maintaining detachment of the retina.

2. Although re-attachment occurs when the cautery is used, there is marked destruction of tissue in the vicinity of the operative wound.

3. Permanent detachment of the retina has not yet been produced experimentally and further progress in a study of retinal detachment must await its experimental production.

4. Methods that do not cause extensive destruction but produce an erodate that seals the retina to the choroid would seem to be the procedure of choice.

LEWIS L. MCCOY, M.D.

Paton, L.: Vestibulo-Ocular Reflex Path. *Br. J. Ophth.*, 1933, xvi, 57.

Paton discusses and shows by means of diagrams the different ways by which the labyrinth impulses can reach and affect the oculomotor controls and how intimately they are linked up with other muscular controls.

VINCENT WENGER, M.D.

## RAR

Schilling, R.: The Apparent Therapeutic Effect of the Roentgen Ray upon the Clinical Course of Acute Mastoiditis; Preliminary Report. *Radiology*, 1933 xviii, 795.

Having observed improvement in mastoiditis following the use of the X-ray for diagnostic purposes, Schilling studied the therapeutic effect of roentgen irradiation on thirty-eight cases of acute mastoiditis. In 55 per cent repeated roentgen-ray exposures were followed by recovery. He states that Granger previously reported favorable effects from fractional doses in the cases of infants presenting signs of infection and occlusion without softening. In Granger's in which softening or bone destruction had occurred the results were unfavorable. The author cites also DeJardin's report on the beneficial action of irradiation in inflammatory conditions.

In the author's thirty-eight cases the sexes were equally represented. In all but one case the condition was fair or good. Of seven patients who came to operation after two or more roentgen-ray ex-

posures, all were females with softening or bone destruction.

The technique of roentgen diagnosis of acute mastoiditis recommended by the author includes the use of a standard X-ray machine; 20 ma. exposure for from one-third to two seconds for each plate, depending on the patient's age; a 25-in. distance; a 4-in. spark gap and a 3-in. cone. Two plates are made for each ear.

For treatment, one-quarter of an erythema dose is given with the use of 7.5 ma., an exposure of from fifty to sixty seconds, a distance of 26 in., a 6 3/4-in. spark gap, the Law position, a 3-in. cone, and one filter. CLAUDE V. RICHMOND, M.D.

Asherson, N.: Some Postoperative Results of the Radical Mastoid Operation in Children. Post-operative Otorrhoea. *J. Laryngol. & Otol.*, 1932, xliii, 517.

Asherson reports the results of 100 consecutive radical and conservative mastoid operations performed on children in a consecutive series of about 1,000 cases of chronic suppurative otorrhoea. A dry cavity was obtained in about half of the cases in which a radical operation was done and in about two-thirds of those in which a muscle graft was used. No intracranial complication occurred, and no dead labyrinth was found. About 75 per cent of the patients have their hearing reduced to a whisper at 6 ft. The others can hear a whisper at 5 ft. In no case is there absolute deafness.

Otorrhoea may be classed as persistent only after it has continued for at least six months. Persistent otorrhoea may have its origin in the mastoid evagination (polyp, retention cysts, undischarged secessum) or in the tympanic cavity (stems of the tympanum). The author believes that removal of the ossicles and adenoids is indicated only in cases of chronic otorrhoea with a central perforation.

LEONARD R. McANULTY, M.D.

## NECK

Figi, F. A.: Chondroma of the Larynx: Report of Six Cases. *Ann. Otol. Rhinol. & Laryngol.*, 1934, xlii, 369.

Seven patients with cartilaginous tumors of the larynx have been examined at the Mayo Clinic. The case of 1 was reported by Nye. In this article Figi reports the cases of the 6 others. The 6 tumors described by Figi were in striking contrast to practically 500 malignant neoplasms of the larynx which were observed in the Clinic during the same period. Two of the 6 patients were women. The ages of the patients ranged from thirty-four to sixty-four years and averaged fifty-two years.

The symptoms of chondroma of the larynx are in general those of any slowly growing neoplasm of this organ. Dyspnoea and hoarseness are the most common. Dysphagia was the initial symptom in half of the cases reviewed. The presence of a tumor in the region of the thyroid cartilage had been noted

by 3 of the 6 patients. Because of the inactivity of these neoplasms and the fact that they rarely ulcerate, the symptoms are so insidious that it is difficult for the patient to state a definite time of onset. The patients examined at the Mayo Clinic had been aware of the presence of trouble for from six months to five years prior to the examination. Three of them complained of dysphagia.

In chondroma of the larynx the physical observations are of the utmost importance in establishing the diagnosis. Frequently the nature of the tumor will be suspected from the findings of laryngoscopic examination or palpation in the neck. However, a positive diagnosis based on clinical data alone scarcely seems justifiable. Sometimes the diagnosis can be made from a consideration of the history with the physical findings and roentgen demonstration of the tumor, but as a rule microscopic examination of the tissue is necessary to confirm it.

The treatment of chondroma of the larynx depends upon the site and size of the growth, the character of its attachment to laryngeal cartilages, and its activity. According to Moore, the treatment

of such growths is analogous to that for carcinoma in the same situation and is surgical. It should be added, however, that the usual benign character of these lesions justifies decided conservatism. In the majority of cases laryngofissure and enucleation of the growth, together with its capsule, is the treatment of choice. In cases in which a fairly large tumor is situated in the supraglottic portion of the larynx, subhyoid pharyngotomy may offer a more satisfactory surgical approach.

Three of the 6 patients whose cases are reported by Figs. were well when they were last seen, from one to two years after the operation. One patient did not remain for treatment and died at home three and a half years later. The cause of death is not known, but the extent of the tumor at the time of examination suggests that it was the laryngeal growth. One patient on whom a first-stage laryngectomy for removal of the tumor was performed twenty-one years ago, died of pneumonia. One patient returned to the Clinic with an extensive local recurrence after removal of the chondroma, but refused further treatment.



# SURGERY OF THE NERVOUS SYSTEM

## BRAIN AND ITS COVERINGS CRANIAL NERVES

Vogeler, K., Herbst, G. and Brunsitzki, A. von:  
The Late Results of Injuries Due to Bullet  
Wounds of the Skull (Das Spätschicksal der  
Schädelknochenverletzungen) Deutsche Zeitschrift für Chirurgie 93: 229-245.

The authors discuss the end-results of cranial injuries due to bullet wounds on the basis of a study of more than 1,300 cases. The chief purpose of the study was to determine the value of immediate active treatment of such injuries which was carried out for the first time routinely during the world war. Regarding the immediate value there seems to be no further doubt as the primary mortality was lowered considerably after adoption of such treatment, but regarding the late results there is still considerable uncertainty.

The injuries reviewed are divided into those of the soft parts, those of the dura, those of the brain, those which were fatal, those necessitating compensation at first, and those necessitating compensation today.

Eight per cent of the patients are now dead. Of those surviving, 30 per cent formerly received compensation and 72 per cent are now receiving compensation.

Completely penetrating wounds of the skull occur practically only when the bullet enters the forehead. The authors show by illustrations the course of the bullet in the cases of patients with penetrating skull wounds who are still alive. In a large number of the cases the bullet is still present, but in the majority only small splinters remain. Primary operation for removal of the fragments was undertaken in 63 per cent of the cases. This percentage included soft part injuries. Of the 66 patients who died, 33 died from direct complications of the injury such as meningitis, cysts, brain abscesses, and status epilepticus, 17 died from pulmonary tuberculosis and 4 died by suicide. The authors discuss these causes of death in detail with regard to whether they might have been prevented by some other method of treatment. They conclude that in the majority of cases no other treatment would have prevented death.

Traumatic epilepsy is next discussed. The authors have found that traumatic epilepsy develops in 30 per cent of cases of gunshot injuries of the skull. They discuss its relation to the depth of the wound. Of 117 cases of soft part injuries, traumatic epilepsy occurred in only 1. After injury of bone, dura, or brain, it was considerably more frequent. The authors call attention to the fact that apparently very minor skull injuries are often associated with

very severe brain lesions. Of great importance is the time of appearance of traumatic epilepsy. Convulsions that begin early may improve. The later they occur the more unfavorable the prognosis. A person with a gunshot wound of the skull is never free from the danger of developing traumatic epilepsy, even after many years. The authors have observed cases in which traumatic epilepsy developed sixteen and seventeen years after the injury. They discuss the question as to whether early interference prevents or delays the development of epilepsy. Their statistics seem to indicate that it increases the incidence of the condition. However attention is called to the fact that, in general, primary operation was performed in the cases of more severe injury and that therefore a comparison with cases not operated upon primarily is of no value. On the other hand when the primary convulsions ceased after the surgical removal of irritation the end-results were excellent.

In conclusion the authors state that of 500 persons with skull injuries due to bullets, 300 will die immediately and 100 will die during hospitalization. Of the remaining 100, 10 will die within a few years. About 20 will get well, but if those with soft part injuries are excluded, this number will be reduced to about 7. The latter are the only ones who will recover completely after cranial injuries. The remaining 70 are entitled to high compensation.

Vogeler (2).

Swann, W.: Embryonic Epithelial Rests in the Pituitary Body. *J Surg* 23: 214, 37.

Swann made sections of the pituitary glands of 30 persons who had had no signs of pituitary disturbance. Although "only a few of the 30 glands were examined in serial sections," he found that 71 (30.4 per cent) contained epithelial rests of an embryonic character. The rests were of 3 types. In 33 cases examination revealed squamous cell rests, in 19 primitive epithelial rests and in 5 primitive glandular epithelial rests. Seven of the 71 glands showed cells of more than 1 type. The rests were found in all parts of the capsule and the substance of the gland, but were most common in the capsule of the anterior portion.

See M D Moore M D

Frankel, C. H.: Lesions in and Adjacent to the Sella Turcica. *Am J Surg* 23: 374, 90.

This author gives a clinical discussion, with reports of illustrative cases, of lesions in and adjacent to the sella turcica of the type usually presenting what has been called the chiasmal syndrome. He divides these lesions into the following three types: (1) intracellar adenoma, (2) suprasellar adenoma,

(3) adenocarcinoma, (4) malignant adenoma, (5) adamantinoma, (6) teratoma, (7) ganglioneuroma, (8) suprasellar arachnitis (pseudotumor), and (9) suprasellar fibroblastoma. He states that one out of every eight adenomata of the pituitary gland is an adenocarcinoma. Another important observation is that "the fields in the craniopharyngeal adamantinomata are extremely variable, they may include a bitemporal hemianopsia, homonymous and binasal hemianopsia, concentric contraction, or no obscuration of the fields at all."

While Frazier does not deal with the operative technique in attacking the lesions in the region under discussion, he implies by the legends under some of the illustrations that he has given up the use of the direct transfrontal bone flap and now uses the large, more lateral frontotemporal approach.

LEO M. DAVDOFF, M.D.

Brandão Filho. Tumors of the Brain (Tumores do encéfalo) 1932. Rio de Janeiro, Pimenta de Mello.

This monograph reports in detail the histories and operative findings in five cases of intracranial tumor and one case of hydrocephalus. The tumors included a tuberculoma at the base of the brain, a fibro-endothelioma of the sylvian fissure, a chromophilic adenoma of the hypophysis, gliomatosis of the meninges at the base, and an endothelioma of the cerebellum. After each case report the author reviews some of the literature on the condition and attempts to account for mistakes made in the pre-operative diagnosis in cases in which surgical exploration is negative.

HALE HAVEN, M.D.

McKenzie, K. G. A Surgical and Clinical Study of Nine Cases of Chronic Subdural Hæmatoma. *Canadian M. Ass. J.*, 1932, xxvi, 334.

For the surgical treatment of chronic subdural hæmatoma the author recommends a small opening in the bone in preference to a large osteoplastic resection. He states that with few exceptions it is possible to remove the fluid contents and soft clots by suction. In cases in which the brain does not immediately obliterate the cavity drainage for twenty-four hours is thought to prevent reaccumulation of the fluid.

Two arguments advanced in favor of a large osteoplastic exposure are that in some cases the hæmatoma is solid, and that the better exposure allows removal of the membrane surrounding a liquefied hæmatoma. McKenzie states that in the nine cases he reports no solid hæmatoma was discovered, but if such a hæmatoma had been found a larger exposure could have been made. He believes that removal of the membrane is an unnecessary procedure which may be dangerous, and that stripping of the membrane from the dura may cause oozing which may result in the formation of a new clot. He reports a case in which the subdural hæmatoma re-formed when, on account of the patient's condition, rapid closure without suture of the dura was done. The bleeding may have been from the bone flaps or the

line of the scalp incision. The formation of a new clot is favored when the membrane is stripped from the dura beyond the immediate operative field. The membranes are a reaction to the hæmatoma and probably atrophy or disappear after its removal. Horrax found that the membranes seen at the time of removal of the contents of a hæmatoma by suction through a small opening disappeared in three months. As the outer membrane is usually no thicker than thin blotting paper and the inner membrane is thin and transparent, these membranes will not cause pressure or symptoms when the subarachnoid space is intact.

In five of the nine cases reported by the author a large osteoplastic flap operation was done. Difficulty was experienced in obtaining a dry field. In the four other cases only a small bone opening was made. In two of the latter drainage was not employed and convalescence was delayed. In one, convalescence was satisfactory after drainage was established. In the one case in which drainage was established immediately recovery was prompt. In all of the cases the operation could have been done with a small opening from 1 to 2 cm. in diameter in the upper temporal region, the contents of the sac sucked out, and the drainage tube, 0.25 cm. in diameter, left in place through the dura and outer membrane of the sac. Drainage should be maintained for from twenty-four to forty-eight hours, until no pulsation of saline solution in the tube is observed. As the arachnoid is intact, drainage is not followed by leakage of cerebrospinal fluid.

As a rule the chief complaint is headache. The presence of papilloedema usually leads to a diagnosis of brain tumor unless a definite history of trauma is obtained. Trauma precedes the development of symptoms by from six to eight weeks. Only occasionally is it severe enough to cause unconsciousness. In some cases it may be so mild as to be forgotten.

Hæmorrhage probably occurs from one of the unsupported cerebral veins which cross the subdural space to enter the longitudinal sinus. The blood clot becomes enclosed by a thin membrane having a fine vascular attachment to the dura but no attachment to the arachnoid. In many cases localizing signs are either confusing or absent. Headache immediately after the accident may be of great aid in the determination of the site of the lesion. Retardation of mental processes is frequent, but mental changes other than dullness are uncommon and as a rule operation is followed by complete recovery. The lesion is commonly found at autopsy in hospitals for the insane. This fact raises the question as to whether it may be a cause of insanity. Its frequency in insane persons may be due to the more frequent head injuries sustained by the insane or perhaps to unsupported abnormal vessels in an atrophied brain.

In several of the cases reported there was instability of stance and gait suggesting a cerebellar lesion, but nystagmus was absent. A ventriculogram or one or more exploratory burr holes may be necessary for the diagnosis. Fleming and Jones have

observed eight cases. As in four of these the condition was bilateral, M. Kende has resolved to make a bilateral exploration in the future. He believes that in the diagnosis more attention should be paid to shifting of the pinceal shadow.

R. E. PLATT, M.D.

Taylor, E. W.: Jacksonian Attacks and Brain Tumors. *New England J. Med.* 932, 676, 771

Taylor reports four cases showing the important relationship between focal epilepsy and tumor of the brain. In two of the cases the more common signs of brain tumor were entirely absent. Taylor calls attention to air injection as a great aid in the diagnosis of neoplasms of the brain. He believes that neoplasms is the most frequent cause of localized so-called Jacksonian seizures. He states that surgery remains the only rational method of dealing with focal attacks which have tumor as their presumable cause.

R. GLEN BERNARD, M.D.

### PERIPHERAL NERVES

Fallock, L. J., and Davis, L.: Peripheral Nerve Injuries. *Sixth Installment. Am. J. Surg.* 93, 374, 349.

In the twenty-first chapter of their book on peripheral nerve injuries the authors confine themselves to a consideration of the treatment of injuries which may be termed irreparable. In this group they place cases in which muscle function does not return after suture of the nerve ends and cases of injury so extensive that end-to-end suture is impossible. In such cases various supplementary procedures may restore some degree of function to the involved extremity. These alternative surgical methods are tendon transplantation, neurotization of muscles, and immobilization of joints. In the authors' opinion they should be employed only when nerve regeneration is definitely precluded.

The most efficient of these methods seems to be tendon transplantation. The authors discuss this operation in detail and describe the technique of the transplantations found most useful in compensating for the disability resulting from the most common lesions of individual nerves. In the upper extremity mobility is considered the chief aim of treatment, whereas in the lower extremity function is essential for stable weight bearing.

Neurotization of muscles is most useful in cases in which the nerve branch to a given muscle has been severed near its entrance into the muscle or where it can be freed and implanted at a slightly higher level.

In the twenty-second chapter the authors deal exclusively with lesions of the radial nerve. Of all of the peripheral nerves, the radial nerve is most commonly injured in civil life. The signs and symptoms of radial nerve injuries are considered in detail and the best methods of testing for the various interruptions of function are given. The supplementary movements which are commonly present

are enumerated, together with the methods for their production. Objective sensory loss is often overlooked in cases of radial nerve lesions because of the widespread overlap to palmar sensibility and failure of the examiner to leave the parts examined shaved before the examination. Of all of the peripheral nerves, the radial nerve shows the greatest variation in the areas of loss of sensation to both epidermic and protopathic stimuli.

The extensors of the middle, ring, and little fingers begin to recover first, and the extensors and the adductor of the thumb regain their power last. Simultaneous extension of the wrist and all of the fingers seems to be the final stage in the recovery of voluntary movement. In the radial nerve, as in other nerves, the interlacing of the borders of sensory loss to the various modalities and the recovery of tactile sensibility in islands away from the border of former loss constitutes evidence of recovery.

The surgical anatomy of the radial nerve and its branches is described by the authors in detail. The operative approach to lesions in any part of the course of this nerve and the technique of transplantation to the anterior surface of the humerus to avoid some large defects in the middle third of the nerve are outlined. The latter procedure is not advised if it endangers the nerve to the triceps muscle as the authors consider extension of the forearm a more important function than extension of the wrist or fingers.

HARRI HARRIS, M.D.

Heldrich, L., and Kuestner H.: Dual injuries of the Brachial Plexus (Die traumatische Verletzung des Plexus brachialis). *Deutsche Zeitsch. f. Chir.* 131, 666-671.

In recent times sport and machines have caused a considerable increase in the incidence of dual injuries of the brachial plexus. Before the World War these injuries were rare. The authors report on sixty-two such injuries which were treated at the Breslau Surgical Clinic in the period from 1906 to 1911. These injuries were complications of lacerations and fractures or due to severe compression of the shoulder girdle in a fall or by transmitted force.

In the introduction a detailed description of the anatomical structure of the brachial plexus is given. On the basis of this structure three types of injury are distinguished: (1) the root type, (2) the flexible type, and (3) the nerve-stem type. The severe and moderately severe injuries are associated with total paralysis of the entire upper extremity which recedes more or less after days or weeks and terminates in various forms of residual paralysis. The fact that in none of the cases reviewed was total plexus paralysis observed as a terminal condition is evidence that in the primary serious disease picture compression of the nerves (the compression view of Kuestner) plays an important part. This compression is responsible also for considerable degeneration of the medullary sheaths of nerves which externally appear unaltered as well as for the peripheral and plexus innervation of blood and lymph.

The most severe injuries were produced indirectly. In four cases they were caused by an attempt to stop runaway horses in which the injured person was dragged for a long distance. In both types of injury the extended arm was suddenly pulled upward and backward and kept in this position for a long time. In only one case was it suspected that the roots of the fourth and fifth cervical nerves had been torn out of the spinal cord. In the other cases, as proved by the subsequent favorable course, there was only an overstretching with numerous ruptures into the interior of the nerve structure.

Most of the moderately severe paralyses were the result of frequent falls upon the shoulder, a blow and thrust upon the clavicle or the supraclavicular fossa. Dislocation of the head of the humerus and of the shoulder joint and fractures of the clavicle also came into consideration. Automobile and motorcycle injuries were the exciting causes. In most of the cases the paralysis appeared in the form described by Erb. In only one case was it of the type described by Klumpke.

The light forms of paralysis were usually caused by direct and more continued, but less severe pressure, such as that sustained by stone and coal carriers. In one case Erb's paralysis developed after climbing. Of sixteen cases of obstetrical paralysis, fifteen were of the Erb type and one was of the Klumpke type. In twelve, the labor was ended operatively. It appeared to the authors that avulsion of the nerve roots was probable in only one case. In three cases there were fractures of the humerus and the clavicle, and in one case there was a luxation of the shoulder.

In the prognosis of these cases electrical examination is of the greatest importance. If there is a complete reaction of degeneration, the nerve is severely injured, but this does not necessarily mean a serious anatomical change as it may be due to simple commotion of the nerve. If the reaction of degeneration is only partial, it indicates the presence of a temporary nerve injury.

The authors emphasize especially that in some cases, in spite of the existence of the complete reaction of degeneration, the function of the affected muscle was maintained, whereas on the other side with an existing loss of function the electrical excitability was in no way disturbed. Therefore electrical excitability and function are not always parallel.

In the treatment, the procedures of choice are conservative measures to protect the paralyzed muscles from overstretching and to prevent the development of contractures in the opposing muscles, atrophy of the paralyzed muscles, and stiffening of the joints.

In Erb's paralysis the affected arm was placed in the double right-angle position and movement and electrical treatments were begun early. In addition, stimulating, tapping, and kneading massage were given. The faradic current was used only after faradic excitability had returned.

Operative treatment was undertaken only in cases of plexus paralysis that showed no signs of improvement after six or seven months. However, the results in the six cases operated upon were unsatisfactory as only one of the patients examined two or three years later showed even slight improvement.  
MAX BUDDE (Z)

Adair, F. E. Neurogenic Sarcoma and Its Allied Lesions. A Clinical Study. *Surg Clin North Am*, 1932, **21**, 357.

Of the 317 patients with neurogenic sarcoma admitted to the Memorial Hospital, New York, since 1916, 94 were still living at the time this report was made. The average age of these patients at the time of their admission to the hospital was forty-two years. The author reports cases indicating that neurogenic sarcoma is frequently a familial disease. The tumor occurs most often in the interscapular region, about the knee, on the thigh, in the chest wall, and in the calf of the leg.

Adair emphasizes the importance of careful local excision of such subcutaneous tumors as neuromata, neurofibromata, fibromata molluscum, plexiform or circoid neuromata, and neurogenic sarcomata. He believes that neurofibromata with a diameter of 1.5 cm or more should be looked upon with suspicion as they may have taken on the qualities of malignancy. The excision of these tumors is recommended to obtain the specimen for microscopic examination and accurate diagnosis, to determine the correct treatment, to prevent the future development of malignancy.

In the cases reviewed, amputation of the involved limb gave a high incidence of cure, but surgical extirpation alone and irradiation alone were frequently followed by failure. The best results were obtained by amputation and by wide careful excision of the tumor and its surrounding tissues preceded and followed by irradiation.

EDWARD ZOLLINGER, M.D.

## SYMPATHETIC NERVES

Kulenkampff, D. The Vascular Sympathetics (Ueber das Kreislauf-Sympatheticussystem). *Deutsche Zeitschr f. Chir.*, 1931, **CCXXXIV**, 187.

In an article of twenty-two pages the author discusses numerous problems, raises a number of questions, and gives new explanations of well-known phenomena. The headings of the various sections are: 1. The problem. 2. The circulation. 3. The central position of the sympathetic system. 4. Sensibility to pain and the problem of the sympathetic. 5. Muscle tonus. 6. Reflexes. 7. The mental regulation of the vascular sympathetics.

Kulenkampff states that the distribution of the blood in the body is regulated by mental as well as chemicophysical forces. All are in turn controlled by the sympathetic system with its various centers which terminates in the third ventricle. Observation of the action of narcotics and the approach of

mind blindness are proof of the presence of a central regulator. The cortex is only a passive organ.

The sympathetic system also transmits the sensation of pain to the pain center. The localized comprehensible pain is in contrast to the basal life pain. The fact that sympathetic fibers follow all vessels demonstrates a close relationship between sensibility to pain and the circulation. From this fact Kulenkampff has derived the concept of vascular pain units.

The tonus of both the smooth muscle and the striated muscle depends upon the sympathetic system. The author discusses the problems of muscular atrophy, muscular tetany, and the extraordinary maintenance of the contraction of sphincter muscles.

Kulenkampff states that all reflexes are variations of sympathetic tonus. The forerunner of all reflexes is the reflex to light.

In the last part of the article, which has the title "The unknown," the author discusses the Indian lore of Joganum. F. BAUER (Z).

Dierkhauf, L. and Dierkhauf, R.: Physopathic Contracture Treated by Perihumeral Sympathectomy (Contracture physopathique traitée par sympathectomie perihumérale). *Bull. Soc. de chir. de Toulouse*, 932, XXXI, 231.

The authors report the case of a well-developed young man who sustained a rather severe contusion

of the left elbow in the region of the olecranon and immediately after the accident complained of severe pains radiating throughout the arm. The pains were most severe during the night. For several days the hand was mobile, but then it tended to assume an attitude of flexion. The use of a series of analgesic remedies failed to cause improvement. When the authors were consulted a month after the accident they found a condition similar to that commonly known as Volkmann's contracture in which the hand is held in extension and the distal segments are held in flexion.

They believe that this was a physopathic condition similar to the conditions described by Babinski and Froment. In agreement with the theories of Kéjeff, Albert, Leriche, Tinel, and Bessley they ascribe it to a complex reflex vascular and contractile phenomenon. At operation the perivascular nerve net was resected from the brachial artery at the elbow in the region of its bifurcation and the branches from the median nerve to the perivascular net in this region were sectioned. Oscillometric studies were made before, during and after the operation.

Five days after the operation all movements were possible and the paresthesias had practically disappeared. Thirteen days after the operation the movement of the arm and hand was normal. The authors believe that true psychic influences were ruled out. HALL HAYES, M.D.

# SURGERY OF THE CHEST

## CHEST WALL AND BREAST

Micotti, R. Bleeding Nipple (Sulla mammella sanguinante) *Chir. chir.*, 1932, viii, 442

The case reported was that of a woman thirty-four years old who had borne a healthy child ten years previously. For about four months a slight bloody discharge had occurred from the left nipple about every week for four or five days. Menstruation was not disturbed. There was no pain or tumor in the breast and no axillary lymphadenopathy. Radical amputation of the breast was done. The lesion was found to be a hæmorrhagic cyst-epithelioma.

From the findings in this case and a review of the literature the author concludes that bleeding nipple is usually due to a cystadenoma, cystic mastopathy, intracanalicular papilloma, or hæmorrhagic cyst-epithelioma. As these lesions are precancerous he advises that the bleeding nipple be treated surgically.

EUGENE T. LEDDY, M.D.

Pribram, B. O. The Pathological Significance of the Bleeding Breast (Die pathologische Bedeutung der blutenden Mamma) *Mf. Klin.*, 1931, ii, 1853

Bleeding from the breast is by no means necessarily an indication of the presence of a tumor, especially a carcinoma. Except in cases of vicarious menstruation, bleeding occurs most frequently in the presence of cysts. The author discusses the origin and histological structure of the cysts. He rejects the inflammation and tumor theories of cystic breast as he believes the cyst formation is due to degeneration. He states that the variety of the histological findings in this condition may be understood by considering the physiological changes occurring in the breast—assimilatory processes during pregnancy and dissimilatory processes during lactation with subsequent involution to the resting stage. In cystic breasts all of these changes, which physiologically follow each other, are present at the same time. The histological picture shows, side by side, cells of the building up or active type and cells of the involutive type. This unrest in the histological picture suggests that these cellular formations might easily become malignant and that therefore the cyst formation should be regarded as a precancerous process. The frequency of malignant degeneration is given by Schummelbusch as 8 per cent, by Greenough, Simon, and Thyle as 15 per cent, by Wolf as 45 per cent, and by Bloodgood as 50 per cent.

In addition to the diffuse cystic degeneration there is a localized form occurring usually in the region of the nipple. Because of its proximity to the

main excretory ducts the latter is often the cause of bleeding. Therefore in the presence of bleeding from the nipple this condition should be thought of first. Whereas the diffuse type of cyst formation develops from the acini, the local form develops from the larger lactiferous ducts. The latter differs from the former also in its histological picture, being characterized by prominent papillæ crowding into the lumen of the duct. These papillæ are composed of piled up epithelial cells, a fine thread of connective tissue, and a capillary. They may be so numerous as to fill the lumen of the cyst completely. Under such conditions a tumor growth is suggested and in fact in a few cases metastases have been found. In the author's opinion the best term for this localized cystic degeneration is "cystepithelioma intracanalicular."

With regard to the treatment Pribram states that in the diffuse condition he has obtained good results from X-ray irradiation. In cases of cystepithelioma he removes the entire mass of gland tissue, leaving as much of the fatty layers as possible to preserve the shape of the breast. He does not remove the axillary glands at first, but keeps the patient under observation for a long time. W. MANDL (Z)

Orbach, E. A Contribution to the Etiology of Fibro-Adenomatosis of the Breast—Chronic Cystic Mastitis (Beitrag zur Aetiologie der Fibroadenomatose der Brustdrüse—Mastopathia chronica cystica) *Arch. f. klin. Chir.*, 1932, clxviii, 585

The disease picture of fibro-adenomatosis of the breast is well known from the anatomicopathological standpoint, but not from the pathogenetic and etiological standpoints. The fibro-adenoma is a circumscribed growth separated from the glandular part of the breast by a connective tissue capsule. Chronic cystic mastitis involves the breast diffusely. However transitions are frequently observed. Some fibro-adenomata spread out into the breast tissue without distinct demarcations. In the histological picture, transitions are so frequent that Semb described the disease as "fibro-adenomatosis cystica."

Clinically the surface of both breasts is uneven and nodular. The cysts vary in size from that of a millet seed to that of a small orange. The outer upper quadrant of the breast is especially involved. The nodules are palpable if the breast is gently squeezed sideways, but not when it is pressed against the thorax. The breast is somewhat enlarged and is sensitive to pressure. At times there is an enlargement of the lymph glands.

The author found the disease especially frequent in asthenic women. He believes it may have some relation to tuberculosis. To prove this theory he

carried out investigations with internists. The patients examined were divided into 3 groups. In the first group were placed those with definite evidences of an active or arrested tuberculosis. In the second group, those in which an arrested tuberculosis was suspected, but not proved definitely and in the third group ashenic persons without definite signs of an active or latent tuberculosis. Twenty-seven patients with the disease were examined. Nine (33 per cent) belonged to the first group and 7 to the second group. Eleven patients were not tuberculous. In Groups 1 and 2 together the incidence was about 50.9 per cent. In the examination of 70 patients with tuberculosis a mastopathy was found in 25 (35.7 per cent). Among these were 11 men, of whom 1 had breast disease.

Difficulties are experienced in the diagnosis only in cases of early or rudimentary forms of the condition. The examination should be begun at the nipple and continued apically toward the periphery. Areas larger than a hazelnut and very prominent areoles should arouse suspicion.

To determine the frequency of the disease in otherwise normal persons, the author examined 180 non-tuberculous women. Among these he found the condition in 3 (1.7 per cent). All of the tumors were examined histologically and some of them also bacteriologically. In none was there any evidence suggesting tuberculosis.

To explain the frequency of the condition in association with organic tuberculosis the author assumes that tuberculosis toxins render the breast especially sensitive to the action of gonital or other hormones. He states that in all cases of mastopathy an examination for organic tuberculosis should be made. With regard to treatment he suggests that a course of tuberculin might be of value.

STRAUSSER (2)

FILSH, R. IL: The Occurrence of Roentgen Pleuropneumonia in the Treatment of Breast Cancer. *Am. J. Roentgenol.* 93:2, April, 1935.

Roentgen pleuropneumonia is characterized clinically by a harsh unproductive cough and dyspnea.

The roentgen findings are those which would be expected in the early stages of so-called massive collapse of the lung if this collapse should occur slowly requiring five or six days to reach its maximum. The diaphragm on the affected side is elevated and fixed. The mediastinum and contents are displaced toward the involved side, and there is a diffuse cloudiness of the entire lung field. After a considerable period of time, gradually estimated at from three to eight weeks, the business clears up. The roentgenograms then show a varying degree of fibrosis which with the fixation of the diaphragm and displacement of the mediastinal shadows toward the affected side, remains as a permanent after-effect of the condition. The gross anatomical changes are due to a retractive stress which may have sufficient force to fracture the ribs as in a case reported by the author.

Roentgen pleuropneumonia is rare. It has been observed only after repeated irradiation of the chest wall.

WILSON BAILEY M.D.

Nordhoff, A. E.: Prophylactic Roentgen Irradiation After Surgical Removal of Cancer of the Breast. (Die prophylaktische Röntgenstrahlenbehandlung nach operativer Entfernung von Brustdrüsenkrebs.) *Monat. Tftsch. f. Chir.* 1931, 11, 486.

The author has reviewed the literature regarding the value of prophylactic irradiation after operation for carcinoma of the breast. Orban and Schwenk, Amshretz, Buchholz, Hantse, Späthner, Gasser, Westmann, Pfahler and Parry who report favorably on the combined treatment, are opposed to the two year-old condemnation of the procedure by Porthes, Tilly, Lowen, and Deher and to its repudiation by Hillebrand and Lehmann, the Mayo Clinic, and the American Commission on the Study of Breast Cancer.

In the various statistics the cases and techniques must be compared. In the cases treated at the Mayo Clinic the secondary irradiation was usually carried out by others. The Condensation statistics cover cases from five large clinics, in some of which the technique was inadequate. Consequently the results were unreliable. On the other hand, the supporters of the combined treatment followed an exactly described technique and compared the results with those obtained in unirradiated cases.

The Steinfeld classification is criticized because it is too superficial and too subjective. According to the experiences of Wessink and van Ransdonk, examination of the extirpated axillary gland fat permits a prognosis. When only centrally located glands are affected the prognosis is more favorable than when the peripheral glands are involved.

The author's own material consisted of three groups of cases treated in the period from 1921 to 1927. These included (1) cases of local tumors with, at most, central metastases of the axillary glands, and (2) cases with involvement of the peripheral axillary glands, carcinomatous lymphangitis, and ulceration or osseous involvement of the supraclavicular and infraclavicular glands and (3) inoperable cases with distant metastases.

The surgical treatment was radical operation including the clavicular glands. The irradiation was done with 180 kv. and a filter of 0.5 mm. of copper plus 1 mm. of aluminum. One field in the supraclavicular region measuring 15 by 15 cm. was irradiated. The axilla measuring 8 by 8 and two fields in the thorax usually measuring 15 by 15 were irradiated. The lateral central ray was directed 45 degrees from the median plane and similarly from the sternal border of the normal side. The skin-focus distance was from 35 to 40 cm. Three series of irradiations were given, beginning from the eighth to the tenth day after operation. In ten days 600 r per field were administered. After six weeks, and again from two to three months, 400 r were given.

In the forty-two cases in Group 1 there was no subcutaneous or cutaneous recurrence. Of the thirty-eight cases in Group 2, the treatment was followed by a subcutaneous recurrence in one and an intracutaneous recurrence in twelve. The cases are reviewed individually and the results compared with the statistics of Sanders which include only surgically treated cases. In Sanders' cases the incidence of five-year survival was 27 per cent, whereas in the author's cases it was 36 per cent. Of the author's patients who died after the combined treatment, 15 per cent had recurrences and 23 per cent had metastases, whereas of Sanders' patients who died, 33 per cent had recurrences and 20 per cent had metastases.

According to the favorable experiences at Stockholm, preliminary irradiation should also be given consideration. A prognosis based upon the findings of microscopic examination is rejected.

The author draws the following conclusions:

1 Postoperative roentgen irradiation may prevent dermal, sternal, costal, and axillary recurrences.

2 Therefore moderate irradiation after operation is permissible.

3 If carcinosis of the skin has existed previously irradiation is useless.

C. E. JANCKE (2)

Portmann, U. V. Postoperative Roentgen Therapy for Cancer of the Breast. A Report of 103 Consecutive Cases. *Am J Roentgenol*, 1932, xxvii, 513.

Numerous reports in the literature indicate that when cancer of the breast is treated by operation alone, not more than 30 per cent of the patients are free from the disease after five years. In a series of 103 unselected cases reviewed by the author in which roentgen therapy was used as an adjunct to operation, the incidence of five-year cure was 43 per cent.

WILBUR BAILEY, M.D.

### TRACHEA, LUNGS, AND PLEURA

Ballou, H. C. Some Experiences with Oleothorax. *Am J Surg*, 1932, xvi, 1.

Oleothorax is induced by injecting oil into the pleural cavity. Its purposes are disinfection and compression. It has been employed in the treatment of tuberculous lesions of the lungs and pleura and bronchiectasis. The author cites cases showing its value and limitations as a supplement to pneumothorax in bronchiectasis and reports a case of pulmonary tuberculosis in which it was employed successfully as a supplement to thoracoplasty which had to be abandoned because of activity in the other lung. He states that the continued use of this form of treatment for disinfection and compression is justified only in selected cases in which recognized methods have failed as more and later observations are necessary before the true value of the method in any given condition can be determined.

JACOB M. MORA, M.D.

Frank, L. W. Pulmonary Abscess. *Am Surg*, 1932, xvi, 675.

This article is based on a study of forty-nine cases of lung abscess. In eighteen the abscess followed some type of surgery, in thirteen it developed in the course of pneumonia, in two it occurred in association with a blood-stream infection, in two it was the result of so-called influenza, in one it was due to actinomycosis, and in one it was produced by an aspirated foreign body. In twelve cases the cause was undetermined.

Frank considers drainage essential in the treatment. In many cases postural drainage obtained by having the patient hang the upper part of the trunk over the edge of the bed with the head dependent will result in recovery. For cases in which the cavity drains into the larger bronchi near the root of the lung, Frank recommends bronchoscopic aspiration. When the cavitation is near the center of the lung and communicates freely with a bronchus, pneumothorax is applicable. In certain cases of abscess located in the lower lung fields phrenicectomy is indicated. When other forms of treatment are without results and when the abscess is situated in the periphery of the lung and bronchoscopic drainage is useless, external drainage is necessary. Frank uses a two-stage method. He rarely employs tube drainage as he believes it better to open the cavity widely and pack it with gauze.

ELIZABETH CRANSTON

Young, R. A., Hunter, J., Maxwell, J., Kerley, P., and Others. Discussion on the Diagnosis and Treatment of Abscess of the Lung. *Proc Roy Soc Med*, Lond, 1932, xxv, 1131.

YOUNG classifies abscesses of the lung into (1) abscesses due to inhalation of foreign bodies or infective material, (2) abscesses originating in the parenchyma of the lung, also called "pneumonitis", (3) embolic abscesses, (4) abscesses from extension of adjacent suppurating structures, (5) abscesses resulting from the breaking down of newgrowths, (6) abscesses resulting from the traumatic perforation of the chest wall, and (7) gangrene of the lung. Conditions which simulate abscesses of the lung are interlobar empyema, bronchiectasis, and newgrowth. In cases of acute abscess the patient may be very ill with severe fever and rigors, but a chronic abscess may cause irregular fever. Cough and expectoration may culminate in the copious discharge of pus. The breath is always offensive, and in cases of gangrene is extremely foul. On standing, the sputum separates into three layers. Hemoptysis is common. The physical signs depend on the situation of the abscess. Clubbing of the fingers appears in from six to eight weeks. Roentgen evidence is most valuable because it helps to localize the abscess. When surgical treatment is needed roentgen examination is indispensable. Lipiodol may be of aid in excluding other conditions such as newgrowth and bronchiectasis. Exploratory puncture should not be employed as it may lead to widespread infec-



tion of the pleura. The treatment is medical until the suppurative process is localized. When rupture of the abscess occurs, evacuation of the pus should be promoted by postural drainage. Surgical treatment consists of bronchoscopic evacuation, thoracotomy, collapse treatment by artificial pneumothorax in selected cases or by thoracoplasty phrenic evulsion, and lobectomy.

HUNTER discusses only the single abscesses which form without dilatation of the bronchi. These are more common in men than in women and occur most often in the right lower lobe. In experiments on rabbits Hunter attempted to produce lung abscess by introducing into the trachea lipiodol mixed with ground glass and staphylococci. In no case was he successful. He then introduced lipiodol mixed with staphylococci into the ear vein. This procedure produced lung lesions in every instance. The lesions varied from gray patches at the periphery of the lung to typical abscesses. Hunter therefore believes that lung abscesses are due to a combination of embolism and inhalation anesthetics, and that by avoiding the use of inhalation anesthetics their incidence can be greatly diminished.

MAXWELL states that medical treatment of lung abscess is of little value. Intratracheal medication may have more favorable results. Such antiseptics as erythrol, lipiodol, and 10 per cent gentanol in olive oil have been employed.

KIELLEY regards the X-ray appearances of lung abscess as the most important aid in the diagnosis. An embolic lung abscess seen in its early stages appears in the roentgenogram as a round, sharply defined, homogeneous opacity. Multiple abscesses can be diagnosed only by means of the X-ray, but the examination must be made with the patient lying on the diseased side as well as in the erect posture.

NEON discusses the bronchoscopic treatment of lung abscess. He invariably uses local anesthetics. Of twenty-seven patients whom he treated, fifteen were cured by bronchoscopic treatment alone.

BURKELL refers only to single abscess of the lung following operation on the nose, throat, or teeth. There are four methods of dealing with such a condition: (1) leaving the patient alone (2) bronchoscopy (3) surgical drainage and (4) pneumothorax. Pneumothorax is extremely dangerous, especially in cases of superficial abscess.

EDWARDS points out that from the standpoint of symptoms abscess of the lung is of two types. In one type there is a continuous discharge and in the other an intermittent discharge. As cerebral abscess occurs as a complication far more frequently in cases of undrained lung abscess, Edwards urges early surgical drainage. J. DANIEL WILLIAMS, M.D.

#### ESOPHAGUS AND MEDIASTINUM

Hownath, W.: Dysphagia. *Lancet*, 1931, cccviii, 185.

After discussing the physiology of deglutition the author takes up the various causes of dysphagia.

Among the latter are chronic hypertrophic pharyngitis with an underlying myositis retropharyngeal abscess ulceration at the back of the tongue, as the lingual pillars, or in the pharynx Vincent's angina syphilis malignant disease and pharyngeal paralysis.

The diagnosis of pharyngeal paralysis is made by carefully examining the posterior wall of the pharynx while the patient swallows. When paralysis is present the paralyzed side is pulled over to the normal side. The usual cause of pharyngeal paralysis is a bulbar lesion.

The most common causes of dysphagia are found in the esophagus. Important aids in the diagnosis are fluoroscopy and direct esophagoscopy. The esophageal conditions most frequently producing dysphagia are spasm at the upper and lower end of the esophagus, congenital stricture, cicatricial stenosis, diverticulum, ulceration, foreign bodies, and carcinoma. In some cases dysphagia may be due to pressure on the esophagus by malignant disease of the thyroid, tuberculous glands, an aneurysm of the arch of the aorta, or a mediastinal newgrowth. JOHN H. GUNLOCK, M.D.

Epshtein, A.: Cancer of the Esophagus in the Oncological Institute in Leningrad (Über den Oesophaguskrebs nach Angaben des Onkologischen Institutes, Leningrad). *See Abstr. Arch.*, 1931, 22.

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In the period from 1926 to 1931 303 cases of cancer of the esophagus were treated in the hospital of the Oncological Institute in Leningrad and 7,733 cases in the out-patient department. The most frequent localization of cancer is the stomach, and the next most frequent the esophagus. In the cases of cancer of the esophagus reviewed by the author the condition occurred 3 times more frequently in males than in females. The upper third of the esophagus was involved in 9 per cent of the cases, the middle third in 60 per cent, and the lower third in 31 per cent. In most cases the condition had made considerable progress before the patient came for treatment.

The methods of treating cancer of the esophagus may be divided into 2 groups. The first group belongs to the medical procedures, dilatation with the esophageal bougie, intubation, surgical procedures such as gastrostomy oesophagostomy laryngotomy and nerve section, roentgen and radium treatment electro-excision and electrocoagulation. To the second group belong resection and extirpation of the esophagus. All of the methods in Group 1 with the exception of the use of the bougie are to be considered valuable palliative measures. Dilatation with the bougie appears to be dangerous as it traumatizes the tumor. Gastrostomy is indicated definitely in cases of total occlusion of the esophagus. In other cases, particularly when radium treatment is considered, its indication is relative.

In the author's own cases 196 gastrostomies were done. Most of them were performed by the Kader

method. In 77 cases the operation was done as a preliminary to radium treatment. The postoperative mortality was 25 per cent (30 deaths). The timely performance of this operation improves the general condition and by relieving inflammation in the tumor, discloses the limits of involvement and thus facilitates more precise application of the radium. Among the contra-indications to radium treatment are cachexia, a tendency toward hemorrhage, chest pains (mediastinal involvement), cervical, hepatic, and pulmonary metastases, and bronchial fistule.

In the majority of cases palliative treatment alleviated the symptoms. The duration of life ranged from one-half to two years.

The author concludes that at the present time a cure of cancer of the œsophagus is exceptional. For improvement of the results it is absolutely necessary for the patients to be sent to the clinic early. Patients to be given radium treatment must be selected with care. In the diagnosis, œsophagoscopy should be used only in the cases of patients who are not weakened and who show no tendency to bleed. In the use of radium, exact control of the element introduced into the œsophagus is essential. The length of time the radium should be applied depends upon the general condition, the temperature, and the pain.

G ALPOV (Z)

Frey, E. K. The Technique of Œsophagogastrostomy (Zur Technik der Œsophagogastrostomie) *Zentralbl f. Chir.*, 1932, p. 845

The author reviews his experiences with œsophagogastrostomy. In the majority of the cases the operation was performed by the abdominal route by the technique of Heyrowsky. According to Sauerbruch, the transthoracic route is better and no more difficult. It is of value especially because of the reliability of the sutured anastomosis between the stomach and the œsophagus without inclusion of the serosa.

Frey used the transthoracic method in the case of a man twenty years of age who had been ill for five years and had been subjected to the formation of a gastric fistula. Conservative measures had been unsuccessful. The operation was performed under avertin anesthesia and positive pressure. The incision was made in the ninth intercostal space. The phrenic nerve was crushed. The diaphragm was split from the center to the cardia and the latter was mobilized. The posterior mediastinum was then opened and the markedly dilated œsophagus exposed for a distance of 8 cm. The vagi were not injured. The greater curvature was pulled up through the incision and freed from its vessels until it could be approximated to the œsophagus without tension. The stomach was sutured to the œsophagus with two rows of sutures so that the gastric fold surrounded the anterior half of the curve of the œsophagus. After the application of a clamp on the stomach and aspiration of the œsophagus the gastric and œsophageal walls were opened and

joined by a circular suture. The anterior wall of the stomach was then closed, the incision in the diaphragm was sutured over the anastomosis, and the thoracic wall was closed.

The postoperative course was free from complications. There was no pneumothorax and no exudate formation.

For this operation it is especially important to have a well-functioning pressure apparatus. The after-care is simpler when the transthoracic route is used than when the abdominal route is employed.

SCHLESINGER (Z)

Crosby, E. H. Malignant Tumors of the Thymus Gland. *Am. J. Cancer*, 1932, xvi, 461

Crosby reviews the literature on malignant tumors of the thymus and reports a case of thymic lymphocytoma. Much of his material is presented in the form of tabulations. The article contains also several excellent photomicrographs.

In the case of thymic lymphocytoma the onset of the symptoms was acute and the condition ran a rapidly fatal course. The diagnosis was made at autopsy, which disclosed a mediastinal tumor measuring 30 by 13 by 12 cm. and weighing 1,975 gm. The neoplasm was uniformly smooth and dark red, and its surface was interrupted by numerous lobulations. The heart was practically embedded in the newgrowth. Surfaces made by sectioning had a cellular and meaty appearance.

On microscopic examination the tumor was found to be composed of uniformly and densely packed cells which were chiefly of the small lymphocyte type. There was very little stroma. Many mitotic figures and a few Hassall corpuscles were present. The tumor was vaguely subdivided into lobules by fibrovascular septa from which a reticulum-like stroma branched between its cells.



Reticulum demonstrated by Foote-Menard silver stain.

tion of the pleura. The treatment is medical until the suppurative process is localized. When rupture of the abscess occurs, evacuation of the pus should be promoted by postural drainage. Surgical treatment consists of bronchoscopic evacuation, thoracotomy collapse treatment by artificial pneumothorax in selected cases or by thoracoplasty phrenic evulsion, and lobectomy.

HUNTER discusses only the single abscesses which form without dilatation of the bronchi. These are more common in men than in women and occur most often in the right lower lobe. In experiments on rabbits Hunter attempted to produce lung abscess by introducing into the trachea *Epistod* mixed with ground glass and staphylococci. In no case was he successful. He then introduced *Epistod* mixed with staphylococci into the ear vein. This procedure produced lung lesions in every instance. The lesions varied from gray patches at the periphery of the lung to typical abscesses. Hunter therefore believes that lung abscesses are due to a combination of embolism and inhalation anaesthesia, and that by avoiding the use of inhalation anaesthesia these incidences can be greatly diminished.

MAXWELL states that medical treatment of lung abscess is of little value. Intratracheal medication may have more favorable results. Such antiseptics as argyrol, *Epistod*, and 10 per cent pomecol in olive oil have been employed.

KRAUSE regards the X-ray appearance of lung abscess as the most important aid in the diagnosis. An embolic lung abscess seen in its early stages appears in the roentgenogram as a round, sharply defined, homogeneous opacity. Multiple abscesses can be diagnosed only by means of the X-ray but the examination must be made with the patient lying on the diseased side as well as in the erect posture.

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### ESOPHAGUS AND MEDIASTINUM

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After discussing the physiology of deglutition the author takes up the various causes of dysphagia.

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Epstein, A.: Cancer of the Esophagus in the Oncological Institute in Leningrad (Ueber den Oesophaguskrebs nach Angaben des Oncologischen Instituts, Leningrad) *Von der Arch.*, 1931, xlv, 44.

In the period from 1926 to 1931 303 cases of cancer of the esophagus were treated in the hospital of the Oncological Institute in Leningrad and 1,133 cases in the out-patient department. The most frequent localization of cancer is the stomach, and the next most frequent the esophagus. In the cases of cancer of the esophagus reviewed by the author the condition occurred 3 times more frequently in males than in females. The upper third of the esophagus was involved in 9 per cent of the cases, the middle third in 60 per cent, and the lower third in 31 per cent. In most cases the condition had made considerable progress before the patient came for treatment.

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# SURGERY OF THE ABDOMEN

## ABDOMINAL WALL AND PERITONEUM

Obadalek, W The Etiology of Pneumococcic Peritonitis in Childhood (Die Aetologie der kindlichen Pneumokokkenperitonitis) *Deutsche Ztschr f Chir*, 1931, cccxxiii, 587

The author reviews thirteen cases of pneumococcic peritonitis and two cases of streptococcic peritonitis occurring in children. In thirteen, the diagnosis was confirmed by operation, and in two, by autopsy. When guinea pigs were inoculated with particles of stool or mucus flakes the size of a pin-head, thirteen of them died of pneumococcic peritonitis, whereas guinea pigs inoculated with stool particles from other cases of peritonitis remained unaffected. The course of the experimentally induced pneumococcic peritonitis was strikingly similar to that of the same type of peritonitis in children. The results of the author's experiments support his theory that in children the cause of the peritonitis is in the bowel contents, and that the peritonitis is produced by the migration of bacteria through the bowel wall. The primary condition is an enteritis which is responsible for the diarrhoea characteristic of the early stages of pneumococcic peritonitis. When operation is performed early the peritonitis is found limited to the region of the ileocaecal angle, involving especially the lower 25- to 40-cm portion of the ileum and the appendix. The serosa of this area is markedly congested. Considerable meteorism is present, and sometimes there are erosions of the serosa. In this area the transmigration of bacteria occurs. Of twelve cases in which the appendix was examined histologically, changes varying from superficial erosions to phlegmonous infiltration of the wall, numerous foci of pneumococci, and a mucous content similar to the peritoneal exudate were found in all but three. Even when a contralateral incision revealed exudate on the left side the process was considerably more severe on the right side. The author attributes this fact to the lower bactericidal power of the lower bowel loops and possible stasis above Bauhin's valve.

Between the cases of true pneumococcic peritonitis and those of peritonitis due to perforation of the appendix the author distinguishes transitional forms. He has found that the more definite the local pathological changes in the appendix the more benign is the prognosis of the peritonitic process. In all cases the bowel contents are responsible for the disease. The highly virulent organisms causing pneumococcic peritonitis probably have their origin in the respiratory tract and are swallowed. The infrequency of pneumococcic peritonitis even in pneumonia may be due to an affinity of the bacteria for certain organs and the absence of conditions

such as intestinal catarrh, hepatic insufficiency, and nephrosis which favor their growth in the peritoneal cavity.

The author rejects the theory that pneumococcic peritonitis is due to an ascending genital infection. His reasons may be summarized as follows:

1 Fourteen per cent of the children affected are males.

2 In the female child, abscess formation occurs more frequently on the right side than on the left side, a fact which cannot be explained by ascending genital infection.

3 Ascending genital infection before puberty is very rare, and in the very frequent gonococcal vulvovaginitis of children pneumococcic peritonitis is extremely unusual.

4 No evidences of ascending genital infection have been found at autopsy.

5 In the adult, peritonitis of genital origin is much more apt to be accompanied by intestinal paralysis than by diarrhoea.

6 As the vulvovaginitis is never present before the onset of the peritonitis, it must be attributed to soiling caused by the diarrhoea.

7 Pneumococcic peritonitis would be more common in the genital infections of adults if it were due to ascending genital infection. SEEVERS (Z)

Rankin, F W, and Major, S G Tumors of the Mesentery *Surg, Gynec & Obst*, 1932, liv, 809

Rankin and Major reviewed the records of twenty-two cases of mesenteric tumor in the files of the Mayo Clinic.

They state that from the embryological point of view it is conceivable that mesenteric tumors may arise from displaced remnants of the genital gland, the wolffian body or its duct, or the muellerian duct. Nevertheless, there is no proof that any of the tumors described owed their pathogenesis to such embryonic remains. The data contribute nothing to the origin of serous cysts, but as an epithelial lining was not demonstrable in these tumors it is conceivable that they may have had their origin in hæmorrhage into the mesentery, the solid constituents of the blood having been absorbed. The endothelial lining of the chylous cysts favors the view that these neoplasms are due to dilatation of the lymph spaces rather than to the effusion of chylous material into a preformed cyst. The sanguineous cysts appear to be due to the effusion of blood into the mesentery, and do not seem to be hæmangiomatous. The pathogenesis of the lipomata and sarcomata is easier to understand than that of the cystic tumors.

In the cases reviewed solid neoplasms were more frequent than cystic neoplasms and sarcomata con-

Metastases were found in the pleura, lungs, diaphragm, and myocardium, and there was compression of the trachea, esophagus, and aorta.

When such cases are seen early enough, X ray therapy offers a good prognosis and may even give hope of a complete cure.

The author reviews and discusses the embryology and histology of the thymus gland.

One hundred and sixty-five malignant tumors of the thymus were collected from the literature. Of these, 121 were sarcomata and 44 were carcinomata. In all of the cases the diagnosis was confirmed by autopsy or biopsy.

J. DANIEL WILLIAMS, M.D.

#### MISCELLANEOUS

Benedetti-Alentini, P.: The Indications for Suprasternal Incisions for Relief in Major Traumatizations of the Thorax with Generalized Emphysema (Le indicazioni del taglio soprasternale nel soccorso dei grandi traumatizzati del torace con enfisema generalizzato). *Policlinico, Rome*, 1933 xxxix, vol. part. 337.

As a rule the emphysema noted following injuries to the thorax is transient and limited to the side injured, but occasionally because of the severity of the trauma or peculiar anatomical relations, the air rapidly and progressively invades the cellular tissues of the entire trunk, extremities, neck, and head.

The latter condition is dangerous, especially if the mediastinum is also involved.

The author reports the case of a young man who suffered a severe crushing injury of one side of the thorax. Within several hours there was marked swelling of practically the entire body due to the infiltration of air into the tissues. Respiration was difficult and the pulse rapid, soft, and irregular. Pallor and cyanosis were noted. Because of the intense emphysema the patient experienced great difficulty in speaking and was unable to open his eyes. Surgical treatment was decided upon because of the rapid and steady increase in the emphysema. Under local infiltration anesthesia a transverse Kocher incision was made in the lower region of the neck and blunt finger dissection was done to bring about a communication of the cellular spaces as deep as the trachea. Several small drains were then inserted to maintain a communication with the exterior and the wound was closed. Improvement was noted immediately and after about ten days the emphysema had entirely subsided.

Surgery is indicated in chest trauma with emphysema when there is a progressive compressing pneumothorax due to the valve action of lacerated lung tissue, when there is emphysema of the mediastinum as in the case reported, and when the emphysema is progressive and generalized and the patient's condition is poor.

A. LOREN ROSE, M.D.

Ileocolic invaginations are explained by the meeting of the peristaltic systems of the small and large intestines, and ileo-ileal invaginations by the changes in vascularization and innervation at the end of the small intestine. These changes occur at the level of the termination of the superior mesenteric artery above which the intestine is abundantly vascularized and below which blood is supplied only through the juxta intestinal arc of Treves. In this region local asphyxia due to arterial spasm is common and may play a rôle similar to that of agonal asphyxia in the invaginations seen at autopsy.

In one of the invaginations of the colic type in the cases reviewed the condition was a purely colocolic invagination and in eight it was of cecal origin. These invaginations have usually been considered ileocecal, but Fèvre believes them to be cæcocolic or cæcocolic. This finding is of therapeutic importance as fixation to prevent re-invagination must be made at the site of origin.

The glandular involvement occurring so early in invagination has generally been considered infectious, but Fèvre believes it is due solely to lymph stasis or perhaps œdema of toxic origin.

Clinically two types of invagination are seen, the one acute or subacute, simulating appendicitis, and the other recurrent or chronic, simulating tuberculous peritonitis.

In older children every afebrile appendiceal syndrome with signs of localization in the upper right quadrant of the abdomen should indicate a search for invagination. In eight of the twenty cases reviewed a diagnosis of toxic or ordinary appendicitis was made. The diagnosis must be based on a careful analysis of all the symptoms and the findings of a complete physical examination.

The pain, which is intermittent and sometimes very severe, occurs in the periumbilical region. Vomiting is almost constant. Constipation is common, but in some cases may alternate with diarrhoea. On physical examination rigidity is usually found limited to the right upper quadrant in cæcal invaginations and to the periumbilical region in invaginations of the small intestine. Sometimes there is no muscular defense and the pain is ill defined. The temperature is but slightly affected, ranging from 36.8 to 37.8 degrees C. As a rule the pulse is accelerated to from 80 to 100, but in some cases it may increase to as high as 135. Deep abdominal palpation and rectal palpation should be practiced. A mass was palpated in only five of the twenty cases, but was not sought in all. A mass is palpated more readily under anaesthesia and often constitutes a sign of localization of aid in the choice of the site of incision. Occasionally rectal palpation may be of aid. In the case of a child of five years whose condition was diagnosed as subacute appendicitis applications of ice were made. The next day the rectal thermometer was stained with blood and rectal palpation permitted a diagnosis before the external escape of blood.

When, at operation, the cæcum is of an abnormally bluish color and seems to contain fluid, the small intestine should be examined. In the Ombredanne clinic it is a routine procedure to examine the small intestine when no lesion of the appendix is found.

The recurrent chronic type of invagination simulating tuberculous peritonitis occurred in only two of the cases reviewed. A negative skin reaction will exclude tuberculous peritonitis. In older children, invagination only rarely presents the typical picture of acute invagination with anal bleeding. Intestinal hæmorrhage occurred in only four of the twenty cases reviewed. The diagnosis of invagination is often difficult. Of the twenty cases reviewed it was made in only eight. In eight, the condition was diagnosed as acute appendicitis, in two, as tuberculous peritonitis, and in one, as dysentery. In three, the cause of the occlusion could not be determined. Roentgen examination is of importance.

Among other conditions giving rise to anal bleeding and therefore to be considered in the differential diagnosis are Henoch's purpura, ulcerative tuberculosis, gastric and duodenal ulcer, and ulcer of Meckel's diverticulum.

The prognosis depends upon the time at which the diagnosis is made. If the condition is not recognized clinically or at operation a rapidly fatal termination is the rule. When once the diagnosis is established the prognosis depends principally on the possibility of disinvagination which in turn depends upon the duration of the invagination and its location. In the cases reviewed the mortality was 10 per cent.

The treatment of invagination is surgical. Operation is preferable to opaque lavage because in the early cases in which lavage is indicated surgical intervention is not especially dangerous and in the cases of older children it may be necessary to remove the appendix, a tumor, or Meckel's diverticulum. Fixation of the intestine is a logical complement to operation and was done in fifteen of the twenty cases reviewed. The risk of incorrect interpretation of the roentgen findings is far greater than the risk of surgical intervention.

In older children the surgical treatment of invagination is more complex than in infants, approaching that given in the cases of adults. Ether anaesthesia is satisfactory. The incision is made at the head of the invagination. When the localization is in the upper right quadrant the best incision is one made at the external margin of the rectus, like that of Jalaguier, only a little higher. When the localization is in the lower right quadrant a Jalaguier incision should be made a little farther in than the McBurney incision. In epigastric invagination a median subumbilical incision is best. When the invagination involves the descending colon a median subumbilical and supraumbilical incision is indicated. The primary incision for disinvagination should be made at the site of the invagination. A site of fixation can be easily provided.

attested the largest single group of tumors. The incidence of the tumors was about the same in both sexes.

All of the chylous cysts occurred in the mesentery of the small intestine.

The prognosis of the benign tumors is favorable and that of the malignant tumors is unfavorable.

The diagnosis of mesenteric neoplasms is difficult, but in the presence of a mobile abdominal mass extrinsic to the gastro-intestinal tract the possibility of a tumor of the mesentery should be borne in mind. Mesenteric neoplasms are probably much more common than has been believed.

**Serous cysts.** Among the tumors reviewed there were two serous cysts. In neither was a lining membrane demonstrable in the cyst wall although multiple sections were made.

**Chylous cysts.** Chylous cysts, of which there were three among the tumors reviewed, differed from the serous variety in two important respects. They had an endothelial lining and they all occurred in the mesentery of the small intestine. Definite lymph follicles could not be demonstrated in the walls of these cysts although there were many irregular accumulations of lymphocytes.

**Sanguineous cysts.** The source of the blood in sanguineous cysts is a matter of conjecture. In neither of the two cases of sanguineous cysts in the series reviewed was a history of trauma elicited, and in neither was it possible to discover any co-existing condition which could have been responsible for the hemorrhage into the mesentery.

**Lipomas.** Lipomas are relatively common to the mesentery and it seems very possible that small, fatty tumors occur more often than is generally supposed. Fatty tags, and even larger accumulations of fat, are frequently found in the mesentery in the course of abdominal operations. Among the tumors reviewed by the authors there were five lipomas.

**Fibromas.** Fibromas are of interest chiefly because of their rarity and because they are prone to be confused with malignant growths of the mesentery. Among the tumors reviewed there were two fibromas. One was a fibrosarcoma and the other a fibromyxoma.

**Malignant tumors.** Secondary tumors of the mesentery were excluded from consideration. Among the tumors there were eight sarcomas.

### GASTRO-INTESTINAL TRACT

Miller G. *Intestinal Obstruction. Cerebral M. Am. J. 13, 1916, 440.*

Miller discusses recent advances in the diagnosis and treatment of intestinal obstruction. Although the mortality of this condition averages 50 per cent, in centers making a special study of intestinal obstruction it has been reduced to as low as 5.3 per cent. Miller emphasizes the importance of early operation, stating that the height of the mortality rate is directly proportional to the number of hours

elapsing between the onset of the obstruction and its surgical relief.

The usual symptoms are colicky pain of sudden onset, absolute constipation, and visible peristalsis or distention without fever or an appreciable leucocytosis.

Of the causes of obstruction of the small bowel, strangulation is held to be the most dangerous because of the associated toxic absorption. In cases without strangulation death is due to dehydration with loss of plasma chloride. In the ordinary case of bowel obstruction without strangulation treatment with sodium chloride solution is followed by immediate improvement. Obstruction of the large bowel causes death from toxic absorption. Changes in the chemical composition of the blood are found only in high obstruction. The theory that the lecithin which is the cause of death is disproved by the fact that animals die after the injection of toxic material which has been sterilized.

Early roentgen examination is advisable as it may reveal distention of the small bowel and fluid levels. In cases of low obstruction of the intestines and in paralytic ileus the X-ray reveals the so-called bubble pattern of Trier or the herring bone pattern thought by Fernan to be present only in mechanical obstruction.

In conclusion the author emphasizes the importance of early surgical treatment and analysis of the blood with regard to its chloride and urea content and carbon-dioxide combining power. To overcome dehydration, he recommends the intravenous administration of sodium chloride solution in large quantities.

CHARLES V. BURNER, M.D.

Ferre, M. *Intestinal Invagination in Older Children (Un operation intraveinale du grand enfant). J. de chir. 93, 1927, 972.*

Intestinal invagination in older children, although given little attention in the classical treatises, is a relatively common condition. The author has collected twenty cases in five years at the Gynecological Clinic. The condition occurs more frequently in males than in females. Of the twenty patients whose cases are reviewed by the author, fourteen were boys.

The demonstration of operation of a local lesion responsible for the invagination is much less frequent in children than in adults. In seventeen of the twenty cases reviewed by Ferre, there was no apparent cause for the invagination. The appendix, which has often been considered responsible for the condition, was not infected in any of the cases.

Of the eighteen cases in which the type of the invagination was recorded, the ileum was involved in nine, an ileocolic invagination being present in four and an ileo ileal invagination in five, and the cecum alone was involved in nine. Attention is called to the great frequency of ileo-ileal invaginations. These are usually found from 30 to 50 cm. from the ileocecal angle, but sometimes are higher. Failure to explore at a higher level was responsible for death in one of the cases reviewed.

Ileocolic invaginations are explained by the meeting of the peristaltic systems of the small and large intestines, and ileo-ileal invaginations by the changes in vascularization and innervation at the end of the small intestine. These changes occur at the level of the termination of the superior mesenteric artery, above which the intestine is abundantly vascularized and below which blood is supplied only through the juxta-intestinal arc of Treves. In this region local asphyxia due to arterial spasm is common and may play a rôle similar to that of agonal asphyxia in the invaginations seen at autopsy.

In one of the invaginations of the colic type in the cases reviewed the condition was a purely colocolic invagination and in eight it was of cæcal origin. These invaginations have usually been considered ileocæcal, but Fevre believes them to be cæcocæcal or cæcocolic. This finding is of therapeutic importance as fixation to prevent re-invagination must be made at the site of origin.

The glandular involvement occurring so early in invagination has generally been considered infectious, but Fevre believes it is due solely to lymph stasis or perhaps œdema of toxic origin.

Clinically two types of invagination are seen, the one acute or subacute, simulating appendicitis, and the other recurrent or chronic, simulating tuberculous peritonitis.

In older children every afebrile appendiceal syndrome with signs of localization in the upper right quadrant of the abdomen should indicate a search for invagination. In eight of the twenty cases reviewed a diagnosis of toxic or ordinary appendicitis was made. The diagnosis must be based on a careful analysis of all the symptoms and the findings of a complete physical examination.

The pain, which is intermittent and sometimes very severe, occurs in the periumbilical region. Vomiting is almost constant. Constipation is common, but in some cases may alternate with diarrhoea. On physical examination rigidity is usually found limited to the right upper quadrant in cæcal invaginations and to the periumbilical region in invaginations of the small intestine. Sometimes there is no muscular defense and the pain is ill defined. The temperature is but slightly affected, ranging from 36.8 to 37.8 degrees C. As a rule the pulse is accelerated to from 80 to 100, but in some cases it may increase to as high as 135. Deep abdominal palpation and rectal palpation should be practiced. A mass was palpated in only five of the twenty cases, but was not sought in all. A mass is palpated more readily under anaesthesia and often constitutes a sign of localization of aid in the choice of the site of incision. Occasionally rectal palpation may be of aid. In the case of a child of five years whose condition was diagnosed as subacute appendicitis applications of ice were made. The next day the rectal thermometer was stained with blood and rectal palpation permitted a diagnosis before the external escape of blood.

When, at operation, the cæcum is of an abnormally bluish color and seems to contain fluid, the small intestine should be examined. In the Ombredanne clinic it is a routine procedure to examine the small intestine when no lesion of the appendix is found.

The recurrent chronic type of invagination simulating tuberculous peritonitis occurred in only two of the cases reviewed. A negative skin reaction will exclude tuberculous peritonitis. In older children, invagination only rarely presents the typical picture of acute invagination with anal bleeding. Intestinal hæmorrhage occurred in only four of the twenty cases reviewed. The diagnosis of invagination is often difficult. Of the twenty cases reviewed it was made in only eight. In eight, the condition was diagnosed as acute appendicitis, in two, as tuberculous peritonitis, and in one, as dysentery. In three the cause of the occlusion could not be determined. Roentgen examination is of importance.

Among other conditions giving rise to anal bleeding and therefore to be considered in the differential diagnosis are Henoch's purpura, ulcerative tuberculous, gastric and duodenal ulcer and ulcer of Meckel's diverticulum.

The prognosis depends upon the time at which the diagnosis is made. If the condition is not recognized clinically or at operation a rapidly fatal termination is the rule. When once the diagnosis is established the prognosis depends principally on the possibility of disinvagination which in turn depends upon the duration of the invagination and its location. In the cases reviewed the mortality was 10 per cent.

The treatment of invagination is surgical. Operation is preferable to opaque lavage because in the early cases in which lavage is indicated surgical intervention is not especially dangerous and in the cases of older children it may be necessary to remove the appendix, a tumor, or Meckel's diverticulum. Fixation of the intestine is a logical complement to operation and was done in fifteen of the twenty cases reviewed. The risk of incorrect interpretation of the roentgen findings is far greater than the risk of surgical intervention.

In older children the surgical treatment of invagination is more complex than in infants, approaching that given in the cases of adults. Ether anaesthesia is satisfactory. The incision is made at the head of the invagination. When the localization is in the upper right quadrant the best incision is one made at the external margin of the rectus, like that of Jalaguier, only a little higher. When the localization is in the lower right quadrant a Jalaguier incision should be made a little farther in than the McBurney incision. In epigastric invagination a median subumbilical incision is best. When the invagination involves the descending colon a median subumbilical and supraumbilical incision is indicated. The primary incision for disinvagination should be made at the site of the induration. A site of fixation can be easily provided.



for by a secondary incision. The second step consists in the determination of the site of the intussusception and the third, disinvagination. Only gangrene constitutes a contra-indication to disinvagination. Fixation should be practiced in all cases in which the general condition permits and the invagination does not involve a portion of the intestine which is normally mobile. Appendectomy is a logical procedure. A search should always be made for the cause of the invagination. Sometimes there is a tumor benign or malignant, which can be removed. Meckel's diverticulum should always be removed unless it is central and requires a caudiform resection. Under the latter circumstances its removal is best delayed. The abdominal wall should be closed in layers without drainage. In cases in which disinvagination is impossible various procedures may be necessary. Recently Delore and De Girardier have recommended a new extirpation of the invagination through the sheath by longitudinal incision of the intestine. The most approved method is immediate resection of the mass followed by immediate closure of the intestine. However this method has a considerable mortality.

Entero-anastomosis surrounding the zone of obstruction without touching it is indicated only in the cases of patients unable to tolerate primary resection of the gut. The formation of an artificial anus above the site of intussusception is resorted to only in desperate cases.

The end-results of operation seem to be satisfactory. The fixation of the intestine to prevent reinvagination causes no pain or digestive trouble although after anterior fixation the cecum may be painful to palpation for some time.

The twenty cases reviewed are reported in detail.

FRANK S. MOORE.

MEKINS, F.: A Clinico-Operative Contribution to the Study of Surgical Tuberculous of the Intestines. (Contributo clinico-operativo allo studio della forma di tubercolosi intestinale di carattere chirurgico.) *Ann. ital. di chir.* 23, 24, 25.

The author reports three cases of surgical tuberculosis of the intestines representing three types of the condition—the hypertrophic, the ulcerative and the cicatricial. He states that the hypertrophic type is often primary in the ileocecal region (tuberculosis perityphlitis) and when possible should be treated by intestinal resection. In the ulcerative type, surgical treatment will not effect an absolute cure, but often causes noteworthy improvement. In the cicatricial type found in the transverse colon, extensive resection of the bowel is not advisable as better results may be obtained by a simple short-circuiting anastomosis of the colon.

In the author's opinion, ileocecal and ileocolic resection should usually be performed in one stage. The speed at which the operation may be performed may be increased and the danger of sepsis decreased by the use of the von Pez apparatus.

KRISTOFR SPINCO, M.D.

WILSON, P., and BAUMANN, J.: Perforation of Tuberculous Ulcers of the Intestine into the Peritoneal Cavity. (La perforation des ulcres tuberculeux de l'intestin en peritonée libre.) *J. de chir.* 1913, xxviii, 50.

The classical texts say that perforation of tuberculous ulcers of the intestine into the free peritoneal cavity with resulting diffuse peritonitis is rare because adhesions are usually present between the loops of small intestine and the ulcers perforate into the intestine or rupture into a part of the peritoneal cavity which is walled off by adhesions and cause the formation of an abscess. However the authors believe that perforation into the free peritoneal cavity is not so rare as is generally supposed. They have seen three cases. They report these cases in detail and review five cases from the literature.

In the literature they have found three cases of perforation of the large intestine and fifteen of perforation of the small intestine into the peritoneal cavity with resulting diffuse peritonitis. In one of their own cases there was a perforation of Meckel's diverticulum. Three of the eighteen cases were cured by operation. One of the authors' patients died about three months after operation from tuberculous peritonitis. Another who was operated upon in November 1911 was in good condition in November 1913. The patient with a perforation of Meckel's diverticulum died three weeks after operation from pulmonary tuberculosis.

The patients who were saved by operation were operated upon within two or three hours after the diagnosis of acute diffuse peritonitis was made. The authors believe that if cure of a perforated intestinal ulcer in some early life may often be saved. The chief essential is closure of the perforation. Resection is contra-indicated because the patient is not in a sufficiently good condition to withstand it and, the tuberculosis being generally quite extensive, it would be necessary to make the anastomosis in conditions of ulcerated tissue.

As in any acute diffuse peritonitis, it is advisable to drain the cul-de-sac of Douglas. A small fistula developed in the authors' case in which this was done, but soon closed.

The late prognosis should always be reserved as the patient may succumb to progressive tuberculosis of the intestine or some other part of the body.

ARMY COSM MONROE, M.D.

MARTY, J.: Ulcer of Meckel's Diverticulum (L'ulcère du diverticule de Meckel). *Revue de chir.* 1914, N. 4, 1.

Ulcer of Meckel's diverticulum was first described as such in 1915 by Hirschbein in reporting the case of a child aged four and a half years who died of peritonitis. The number of indisputable cases reported to date is four-three.

The diverticulum with an ulcer has the same characteristics of location, shape and size as the ordinary diverticulum, but its walls are thickened and less supple. The ulcer resembles the classical

peptic ulcer of the stomach or duodenum. The perforation of such an ulcer is from 2 to 5 mm. in diameter.

Under the microscope the ulcer shows the presence of gastric mucosa. This gastric epithelium is quite frequent in diverticula not affected by ulcer. Ulcer occurs at the point where the intestinal mucosa meets the gastric mucosa. In Fèvre's case duodenal mucosa was found. According to Schaetz, this occurs in 10 per cent of diverticula. In some cases the microscope showed, at the site of the ulceration, the open arterioles which had been the cause of the hæmorrhages.

Most authorities now agree that the ulcer is due to the action of the acid secretion of the gastric mucosa on an intestinal epithelium which is accustomed only to contact with alkaline fluids.

Unless there is hæmorrhage or perforation, there is no sign to betray the presence of the ulcer. Ulcer of Meckel's diverticulum occurs much more frequently in males than in females. Nearly all of the subjects were under twenty years of age, and sixteen of them were infants. In the cases of patients more than twenty years of age at the time of operation the history indicated the occurrence of hæmorrhages in childhood.

Intestinal hæmorrhage marks the beginning of the ulcer clinically. It is usually repeated, several bloody stools being passed daily. The blood is red and undigested. In some cases the hæmorrhages occur every day for several weeks causing severe anæmia and sometimes death.

Perforation is a serious and frequent complication of ulcer of Meckel's diverticulum. It sometimes occurs after a period of vague abdominal pains, generally during apparent health. As a rule there is a history of hæmorrhages. The perforation usually occurs into the free peritoneal cavity. The initial pain is periumbilical.

In most cases the course of the condition seems to be rapid, perforation occurring a few weeks or months after the first hæmorrhagic manifestations.

In the forty-three cases reported to date the incidence of cure was 63 per cent, but in the thirty-four in which operation was performed it was 80 per cent.

In the diagnosis, other causes of hæmorrhage must be eliminated. Enteritis with its painful attacks, febrile reaction, and the passage of stools made up of blood, mucus, and pus does not present the same picture. Melæna of the newborn occurs in the first days of life whereas ulcer of Meckel's diverticulum does not become manifested until after several months. In the cases of adults, gastric or duodenal ulcer must be considered. A history of hæmorrhages in childhood is of importance. The state of digestion of the blood passed, the digestive symptoms, and the findings of roentgen examination must also be considered. A polyp or a tumor of the large intestine will be difficult to differentiate. In some cases the diagnosis of purpura has been made. If there have been no hæmorrhages or if the occurrence of

hæmorrhages has not been recognized all of the causes of peritonitis must be considered.

If operation is performed during a period of calm, the diverticulum should be ablated. In the course of a hæmorrhagic period, operation should be done as early as possible. If operation is performed for perforation only, minimal surgery should be done, the rest of the necessary surgical procedures being delayed until a more favorable time. The perforation should be closed or, if this is impossible, exteriorized. As exteriorization is very unsatisfactory it should be done only when the patient cannot support the long and difficult exeresis. The median route is the best approach.

The article has a bibliography of about twenty-five references.

PAGE

Gordon-Watson, Sir C. The Diagnosis and Treatment of Carcinoma of the Colon. *Brit M J*, 1932, 1, 969.

Malignant disease occurs more frequently in the stomach and colon than in the small intestine. This may be due to the fact that the surface epithelium of the stomach and colon must undergo more active reproduction and is subject to more irritation and mechanical injury than the surface epithelium of the small intestine.

An early diagnosis of carcinoma of the colon is difficult. As a rule the first symptom is a disturbance in the regularity of action of the bowels. If a growth arises in the cæcum or ascending colon or the proximal transverse colon the bowel wall is irritated and peristalsis is increased. Bleeding due to congestion usually occurs and gives rise to obvious and perhaps severe anæmia. In the early stages pain is rare, but there may be a sense of discomfort and uneasy movements of the bowel. Growths in the cæcum and the transverse and pelvic colons are often palpable. More than half of the growths of the large intestine involve the pelvic colon. In a considerable number of such cases the diagnosis can be made with the sigmoidoscope.

Although a probable diagnosis of carcinoma of the colon can frequently be made on the basis of the clinical symptoms and the findings of palpation, an absolute diagnosis is more often possible by X-ray examination. The barium meal and barium enema are of aid. A roentgenogram of the abdomen made without barium may be of value in showing distention of some portion of the colon by gas.

In radical surgery for cancer of the colon and rectum a high operability rate is associated with a high mortality rate and vice versa. Preliminary drainage reduces the mortality of radical surgery about half. In the absence of active or threatened obstruction the advisability of preliminary drainage must be considered. In cases which are poor risks, preliminary drainage followed by one-stage resection and anastomosis is the procedure of choice. In the absence of obstruction, one-stage resection and anastomosis with proximal drainage nearly always gives a good result.

In the absence of visceral metastases the majority of cases of cancer of the colon may be treated radically. Many cases that at first appear hopeless are permanently cured by bold surgery.

In conclusion the author reports that the operative mortality of resections performed by him in the period from 1921 to 1935 was 23 per cent, whereas that of resections performed by him in the period from 1926 to 1931 was only 13 per cent.

EAST CLARK, M.D.

## LIVER, GALL BLADDER, PANCREAS, AND SPLEEN

Cloft, A.: Hepatic Hemorrhages (Emostasi epatica). *Ann. Med. Chir.* 31, 36.

Cloft studied experimentally the value of oleotomography, pigeon muscle, and tabotamp in decalcated sterilized animal membrane used as a tampon which is later absorbed) in the control of bleeding from the liver. He obtained satisfactory results with all three. In no instance did secondary hemorrhage occur. He reports his experiments in detail and reviews the literature on the various methods employed for hepatic hemorrhages.

PETER A. ROSE, M.D.

Clute, H. M.: The Surgical Management of Obstructive Jaundice. *Surg. Clin. North Am.* 32, 525.

In the young, obstructive jaundice is caused most frequently by infectious cholangitis in adults, by stones in the common duct in old persons, by cancer and in persons previously operated upon for biliary disease by stricture of the common duct. Obstructive jaundice causes physiological disturbances in the liver alterations in kidney function, and disturbances of the blood-clotting power.

Successful treatment of obstructive jaundice depends upon adequate estimations of liver, kidney, and blood function. Liver function is determined most satisfactorily by daily estimations of the bilirubin content of the blood and repeated urea nitrogen tests. Kidney function by daily estimations of the non protein nitrogen of the blood and the tendency to bleed, by the Linton test of the sedimentation rate of the red blood cells.

Preparation for operation must include an adequate fluid, salt, and glucose intake. These prepare the liver, kidney and blood adequately. In severe cases, transfusions of whole blood are advisable. The intravenous administration of calcium has been abandoned.

Operation is best performed under spinal anesthesia. Before any operation on the common duct or gall bladder the biliary tract should be carefully explored. The author believes that stones in the common duct can be ruled out with practical certainty if a soft rubber catheter enters the duodenum readily and if fluid flows into the intestines readily and without washing out stone fragments. In the cases of seriously jaundiced patients relief of the obstruc-

tion is the most important consideration. Therefore a two-stage operation may be best. If the presence of malignancy is questionable, the gall bladder should not be removed. If strictures of the common duct is found, direct anastomosis to the duodenum is the procedure of choice. End-to-end anastomosis of the bile duct is least successful.

The most serious postoperative complication is liver shock, which is characterized clinically by severe depression of all bodily functions. The treatment of this condition consists in the intravenous administration of saline solution, glucose, adrenalin, and other stimulants. Kidney failure is best treated by the intravenous administration of glucose and salt solution. Frequently 500 c.c.m. of a 50 per cent glucose solution given intravenously will stimulate kidney secretion immediately. When the slightest indication of postoperative hemorrhage is noted, direct transfusions should be begun at once.

If the pancreas fails to clear up after drainage of the common duct, a stone may have been overlooked, the T tube may have become kinked, or cholangitis may be present. In some cases re-examination after the injection of Ipiodol into the tube may reveal the cause. The T tube may be removed from eight to ninety days after the operation, depending upon the pathological changes found at operation. FRANCIS H. MORRIS, M.D.

Kashner, G. and Capen, L.: Clinical and Experimental Considerations of the Function of the Sphincter of Oddi and of the Graham and Antonucci Methods of Cholecystography in the Case of a Patient with a Biliary Fistula (Considerazioni cliniche e sperimentali sulla funzione dello sfintere dell'Oddi nei metodi di cholecistografia del Graham e dell'Antonucci in individuo portatore di fistola biliare). *Fedele, Roma, 1932, vol. 2, no. 485.*

The authors report studies made in the case of a patient who developed a biliary fistula after the drainage of a suppurative echinococcus cyst of the liver. By injecting the fistula with a radio-opaque fluid they were able to demonstrate all of the biliary passages roentgenologically. The common duct was visualized completely down to the sphincter of Oddi which was contracted and prevented the escape of the opaque fluid into the duodenum. The injected fluid was gradually accumulated and concentrated in the gall bladder.

In another series of studies on the same patient the authors determined the iodine content and the amount of bile discharged from the fistula and the intensity of the cholecystograms obtained by the methods of Graham and Antonucci. They found that Graham's method induced the extrusion of bile with a low iodine content which was carried to the gall bladder to be concentrated, whereas the method of Antonucci caused the rapid excretion of bile with a high iodine content which required less concentration by the gall bladder for the production of a distinct roentgenogram. PETER A. ROSE, M.D.

Kjaergaard, S. The Indications for, and Results of, Surgical Treatment of Gall-Stone Disease (Indikationen und Resultate der chirurgischen Behandlung von Gallensteinkrankungen) *Acta chirurg Scand*, 1932, lxx, 401

To determine the primary and end-results of surgical treatment of gall-stone disease the author has reviewed some recent Scandinavian statistics.

In his own material, which includes 100 cases, the mortality was 7.9 per cent. If operations for recurrences and cancer complications are excluded, it was 6 per cent. In the cases of patients under forty years of age it was 2 per cent, in those of patients between forty and fifty years of age, it was 3.5 per cent, and in those of patients over fifty years of age it was 20 per cent. In 62 cases in which choledochotomy was done, the mortality was 12.9 per cent, and in 122 cases treated by cholecystectomy, exclusive of 2 cases of perforation with peritonitis and 1 case with cancer complications, it was 2.4 per cent.

During acute cholecystitis the danger of expectant treatment is relatively slight. In older cases less suitable for operation the danger is considered less than that of surgical treatment.

Of 173 patients followed, 13 are dead. Of the surviving 160, 70.6 per cent have a fully satisfactory result, 20.6 per cent have mild complications, and 8.8 per cent have more severe complications. The corresponding figures for patients treated by choledocholithotomy are 66.7 per cent, 16.7 per cent, and 16.6 per cent.

The author disapproves of primary closure without drainage.

In cases of gall-bladder stasis and adhesive pericholecystitis without calculi the end-results are less satisfactory. In such cases a search should be made for predisposing conditions.

The author discusses the indications for operation in the various forms of gall-stone disease. The increased mortality in patients past the age of forty-five years necessitates special care in looking for contra-indications in such patients.

The author advises refraining from operation during attacks of acute cholecystitis unless the patient is young and the condition is especially suitable for operation. The frequency of complicating acute affections of the pancreas does not constitute an indication for operation during an attack.

Frey, E. K. A New Internal Secretion of the Pancreas, the Circulatory Hormone Kallikrein, and Its Therapeutic Application (Ueber ein neues inneres Sekret des Pankreas, das Kreislaufhormon Kallikrein, und seine therapeutische Verwendung) *Deutsche Ztschr f Chir*, 1931, ccxxxv, 481

According to the findings of Frey's investigations, kallikrein, which is found in many of the fluids in the human body, has its origin in the pancreas not only in man but also in other mammals. It loses its activity when heated and is reversibly changed into

an inactive combination by an "inactivator" which is present in the blood. It has no relation to histamin, cholin, or other bodies with a similar effect. Although it comes from the pancreas, it has no relation to insulin, which must be distinctly differentiated from it. In contrast to kallikrein, insulin is soluble in 80 per cent alcohol and penetrates a parchment membrane. Kallikrein is destroyed by acid, whereas strong acid is used in testing for insulin. In contrast to kallikrein, insulin is destroyed only very slowly and irreversibly by the ferments in the blood. When injected intravenously into dogs, insulin has practically no effect on the curve of the carotid blood pressure. One hundred units of insulin have less effect upon the latter than one unit of the circulatory hormone. Insulin provokes hypoglycemia in normal animals whereas kallikrein does not alter the blood-sugar level of normal animals. However, insulin injected into depancreatized animals produces a considerable increase in the excretion of kallikrein in the urine, manifestly by mobilizing the kallikrein still present in the blood and tissues. If kallikrein is injected into an animal made diabetic by pancreatectomy it causes a considerable lowering of the blood sugar, a result which is produced also in patients with high blood sugar. Therefore kallikrein may be used, even by oral administration, to reduce the blood sugar in cases of severe or moderately severe diabetes. The oral administration of kallikrein probably renders the treatment with insulin more intensive, but, curiously enough, it does not lower the normal blood sugar content.

Kallikrein is not related to the angiotensin of Gley and Kisthinos. The inactivator of kallikrein in the blood can be demonstrated in especially large amounts in the lymph nodes and parotid glands of cattle (gland inactivators). The combination of kallikrein and gland inactivator may be broken up by acids. The circulatory hormone therefore appears in the organism in two forms: (1) an active form in the pancreas and the urine, the inactivator apparently being split off by the kidney, and (2) an inactive form in the circulation. But also in the circulation it may be split by the formation of even the slightest amount of acid metabolic products, such as occurs in inflammation. Under such conditions the hormone separates from the inactivator and causes dilatation of the vessels, a fact giving new significance to reactive hyperemia. Also of great importance in the vascular reaction is the inflowing of kallikrein in spurts. The effect of kallikrein is manifested in the dilatation of the finest vessels of the skin, musculature, brain, lungs, and heart. This is demonstrated clearly by capillary pictures. The toxic margin of kallikrein is very large. Kleeberg and Schlapp consider kallikrein non-toxic.

In its therapeutic use, kallikrein is injected intramuscularly for the purpose of slowly lowering the blood pressure in conditions such as hypertension. The dosage now employed is smaller than that used formerly. As a rule an injection of from 1 to 4 units

is given twice daily for several weeks. Without exception, all patients have noted an improvement in their general condition. In a series of cases the lowering of the blood pressure has persisted for from several months to over a year even after the treatment has been stopped. In some cases, however, the hypertension recurs. On the other hand, in cases in which the blood pressure is too low it gradually rises. Therefore kallikrein possesses the peculiar property of lowering an elevated blood pressure, maintaining the normal tension, and elevating an abnormally low pressure.

Kallikrein is not recommended for septic and nephrogenic hypertension, but in essential hypertension pathological constituents in the urine due to secondary kidney damage disappear following its use. It has given good results also in angina pectoris and in most cases of intermittent claudication. However, intermittent claudication is not always based on arteriosclerosis. Qualitative changes in the pulse in the foot are regarded as the most important sign in intermittent claudication. Claudication is often spastic frequently suggesting Raynaud's disease. The neurologists consulted by the author included many of the cases of intermittent claudication with this condition. In about half of the cases treated there was considerable improvement with return of pulsation. Obviously it is the spastic factor rather than the anatomical factor of intermittent claudication which is decisive. In this disease 2 units of kallikrein is administered intramuscularly twice daily at first. After several days, 1 unit is given twice daily and in severe and

resistant cases, 4 units twice daily. Definite improvement occurs within the first few days. Sometimes complete recovery occurs. In one case complete recovery persisted for one and one-half years. In conditions which do not respond easily the injection treatment must often be continued for weeks or months. The improvement may be manifested very slowly. Often no improvement is noted for two to three weeks.

In angitis obliterans the results of kallikrein treatment are not always brilliant, but complete failure is rare. In erythromelalgia the author has never seen good results, and in acrocyanosis he has seen them only occasionally. In typical Raynaud's disease the effect of kallikrein is excellent. It is interesting that in the most severe cases, which led to gangrene and amputation, a very careful examination of the specimens revealed no changes which even approximately explained the rapid death of the tissues. It is evident that in this disease the vasodilating effect of kallikrein would be most effective. It is very effective also in arteriosclerotic conditions in which spasm is present. On the other hand, in severe advanced arterioangrene kallikrein is often powerless. Its results have been poor also in diabetic gangrene. In arteriosclerotic as well as in diabetic gangrene, its effect depends upon the degree of vascular occlusion, the general condition, and especially the rôle played by inflammatory changes. In both mild and severe arthritis good results are obtained. The antidiabetic effect of kallikrein and its stimulation of calcium formation in fractures are emphasized. Lessa (2).

# GYNECOLOGY

## UTERUS

Auvray Curettage and Perforation of the Uterus (Curettage et perforation par le curettage) *Bull Soc d'obst et de gynec de Par*, 1932, xxi, 85

The author limits himself to a discussion of curettage in cases of retained secundines following abortion. He advises evacuation of the uterus in all cases, febrile and afebrile.

For the evacuation of retained secundines he advises the use of a dull curette in preference to the use of the finger as the former is easier and more aseptic, it requires less dilatation of the cervix and it empties the uterus more completely and with less traumatism.

With regard to the treatment of perforation of the uterus he says that each case must be considered individually. In a non-febrile case the curettage should be stopped immediately, no packing should be left in the uterus, the patient should be kept very quiet, an ice cap should be applied to the abdomen, and vaginal douches should be administered. If any signs of injury to the bowel appear the abdomen should be opened immediately. Auvray prefers laparotomy to posterior colpotomy.

In cases in which the perforation is followed by bleeding and in cases with infection, laparotomy should be performed immediately with or without sacrifice of the uterus. ISAAC ANDRUSSIER, M.D.

Săvulescu, D. A Contribution to the Study of Cicatricial Stenoses of the Cervix Uteri (Beitrag zum Studium der Narbenstenosen des Uterushalses) *Rev obst*, Roumania, 1931, x, 8

The frequency of cicatricial stenoses of the uterine cervix has increased in recent times because of the increased frequency of criminal abortion. The condition is unrecognized and improperly treated by most physicians. The diagnosis is based exclusively upon sounding of the cervical canal with a fine Hegar sound and is easily missed when this method of examination is not employed.

Subjectively, cicatricial stenosis of the uterine cervix is manifested by absence of menstrual bleeding following a curettage. At the time of the expected menstrual hemorrhage there are severe sacral and abdominal pains of dysmenorrhoeal character accompanied by vasomotor disturbances such as flushes of heat, attacks of perspiration, and polakiuria. The attacks of pain continue for two or three days. On vaginal examination the internal genitalia are found to be congested and very sensitive to pressure, but this condition is present only during the attacks of pain. True symptoms of loss of ovarian function are not present, and the administration of ovarian hormone aggravates the subjective

symptoms. Probing of the cervical canal reveals cicatricial closure. However, a true hœmatometra never develops. This is explained, on the one hand, by the fact that the amount of blood exuded in the uterine cavity during the menstrual period is small and, on the other hand, by the fact that the blood flows through the abdominal ostia of the tubes into the cul-de-sac of Douglas. If the cicatricial closure is perforated with a fine sound a few cubic centimeters of old grumous blood escape.

The cause of the cicatricial closure is either a too rapid and rough dilatation of the cervical canal which produces tears and subsequent stenoses or a too sharp and too severe curettage which favors the formation of cicatricial tissue, thereby interfering with the restoration of normal cervical mucous membrane. The site of the cicatrix is usually the inner cervical os, which has a thickness of from 1 to 3 mm.

When properly treated the cicatricial contraction of the cervical canal may be definitely relieved. This is true especially when the treatment is followed by gentle dilatation of the cervix over a period of several months. The woman can subsequently conceive and go through a normal labor. However, if she is not kept under constant observation a recurrence may develop.

The treatment indicated is perforation of the cicatricial contraction with a No. 2 Hegar sound following preliminary exact determination of the position and shape of the uterus. After the communication with the uterine cavity has been restored, thin laminaria should be inserted for from twelve to twenty-four hours and then replaced by laminaria with a larger circumference. The dilatation with laminaria tents should be repeated every six months to prevent recurrences.

The author reports thirty cases. BICKEL (G)

Bickel, L. The Symptoms of Genital Prolapse and the Value of Vesicovaginal Interposition of the Uterus and Its Modifications. Kjelland's Plastic Operation, Fixation of the Fundus of the Uterus, and the Interposition of a Uterine Stump (Zur Symptomatologie des Genitalprolapses und zur Leistungsfähigkeit der Interpositio uteri vesicovaginalis und deren Modifikationen, Kjellandsche Plastik, Einnaehung des Fundus uteri und Interposition eines Uterusstumpfes) *Arch f Gynaek*, 1932, cxxviii, 423

In the period from April 1, 1928, to July 31, 1930, 1,477 women with various grades of genital prolapse were examined in the gynecological clinic of the Charité Hospital. These constituted 9.4 per cent of all women visiting the out-patient department during that time. Three and six-tenths per cent of the women with prolapse were nulliparae.

After a brief discussion of the limits within which primary treatment is justifiable and an account of hospital treatment for ulceration and diseases of the bladder the author reports on 233 operations for genital prolapse. He discusses in special detail the Wertheim-Schauta interposition operation, which was done in 40 per cent of the cases. Kjelland's interposition, which was done in 9 per cent and the interposition of the stump or of a uterus reduced in size during the operation, which was also done in 9 per cent.

After a review of the indications for interposition, the subjective symptoms in 107 cases before and after the operation are tabulated. These were a feeling of sinking, bladder symptoms, symptoms associated with defecation, abdominal pain, backache, haemorrhages, and leucorrhoea. In other tables are presented the objective findings in these 107 cases before operation and in the cases of 90 women who were re-examined after the operation.

Of the 150 women who were operated upon 5 died, 3 from embolism, 1 from suppurative cerebrospinal meningitis following an attempt to induce lumbar anesthesia, and 1 from streptococcal sepsis. In the case of the last one a ruptured dermoid cyst and a hydromyxoma were removed by the vaginal route at the same operation. In the 10 cases in which Kjelland's operation was performed there was 1 death from secondary haemorrhage.

Of the 90 women who were re-examined, recurrence of the cystocele was found in 4 per cent and recurrence of the rectocele in 18 per cent. The uterine prolapse did not recur in any case.

Also in 15 women re-examined after Kjelland's operation there was no recurrence of the prolapse but in 1 of these there was a suggestion of cystocele.

The cases in which the interposition of a uterine stump was done also showed good permanent results. The interposition of a uterus reduced in size during the operation appears to be dangerous and has been abandoned although during the period covered by the report it was followed by no noteworthy disturbances.

The relative rarity of signs of septicemia and of infection is explained by drainage of the wound space between the uterus and vagina.

H. H. SCHEER (C)

Schroeder, R.: The Anatomy of Chronic Gonorrhoea of the Cervix (Die Anatomie der chronischen Cervicogonorrhoe). *Zentralbl. f. Gynäk.* 233 p. 24796.

Schroeder studied the anatomy of gonorrhoea of the cervix in twenty women, ten of whom had had the disease previously and ten of whom still showed evidence of active gonococcal infection. After prolonged treatment of the adnexal inflammation had proved unsuccessful complete extirpation gave successful results.

For comparison, twenty cervixes without gonococcal infection were studied. The results of the inflammatory processes were identical in some

respects, although in others the anatomical pictures differed so markedly that it was possible to distinguish the gonococcal from the non-gonococcal types of infection. On the other hand the cervixes affected by gonorrhoea show no differences among themselves whether the gonococci were still present or not.

In general, the type of epithelial regeneration from undifferentiated subepithelial cells in the squamous epithelium or mucous membrane depends upon the medium. An alkaline medium in protected areas favors the growth of mucous epithelium, whereas an acid medium and an unprotected location of the epithelium favors the development of squamous epithelium. When the abnormal mucous discharge from the cervix ceases, squamous epithelium reforms on the portio in place of the mucous epithelium.

Characteristic of gonorrhoea is the fact that the surface of the cervical canal is often covered with squamous epithelium which is either continuous or in the form of islands. This feature has been described by Burns. The squamous epithelial cells penetrate into and fill the glands. This is ascribed also to the acid reaction of the discharge. In these parts gonococci could not be found within the squamous epithelium. Schroeder considers this finding to be characteristic, or at least suggestive, of gonorrhoea.

In contrast to non-gonococcal inflammation, gonorrhoea shows not only the ordinary round-cell and plasma-cell infiltration of the surface, but also a high grade of invasion along the glands, particularly in the deep portions near the bases of the glands in the form of abscesses. In the vicinity of glands which are lined with stratified squamous epithelium there are often very large abscesses. Jones, Schroeder's co-worker found gonococci also in the depths of the periglandular abscesses. In one rather and questionable case of postgonococcal fistula the gonococcus was found *in vivo* obtained from a small abscess during the course of curettage. A detailed report is being prepared by Jensen.

Rosner (Minn. C.)

Forsini, L. and Gabbi, G. The Presence and Significance of Lymphatic Nodules in the Uterus (Sulla presenza ed significato di noduli linfatici nell'utero). *Riv. sci. di ginec.* 193 214-215.

The authors present an extensive review of the important literature regarding the presence of lymphatic nodules in various tissues. The lymphatic glandular chain is well developed in the female. The primitive lymph glands are those accompanying the main vessels. In relation to some of these chains there is a system of lymph nodules situated at the ends of the capillary abscessations. These are most numerous in the subserosa of organs communicating with the exterior. They may represent true germinal centers or a reaction to inflammation, new growth, or toxemia.

With especial regard to the presence of these nodules in the uterus, the authors studied the

mucosa of many uteri at different periods of life which were obtained at autopsy or operation, and also many specimens of uterine scrapings. Numerous photomicrographs of the preparations are included in the article.

The authors conclude that the presence of lymphatic nodules in the endometrium in newborn and older infants is probably a manifestation of a constitutional thymolymphatism. The nodules which are found in the endometrium of sexually mature women are normal or almost constantly related to ovulation or represent a reaction to protein substances which are capable of exerting a lymphopoietic stimulus to the undifferentiated mesenchyme of the endometrium. In the neck of the uterus the lymph nodules may represent a tendency toward thymolymphatism, especially when they are found in infants. Frequently the cause is an inflammation, a reaction to the toxins from the pathogenic organisms.

All of these reactions probably represent potential defense barriers against infectious or toxic agents.

A. LOUIS ROST, M D

Curtis, A H Chorionepithelioma of the Uterus  
*Surg, Gynec & Obst*, 1932, liv, 861

Curtis reports a case of chorionepithelioma of the uterus in which, after removal of the hydatid mole, eighteen months elapsed before the signs and symptoms of the malignant tumor appeared. Vaginal examination revealed a strikingly positive Hegar sign. Although there were living chorionic cells in the uterus, the fetus had been absent for many months.

Autopsy disclosed characteristic tumors in the uterus, right broad ligament, liver, kidney, and brain. These lesions are shown by illustrations in color.

GEORGE H. GARDNER, M D

Philipp, E Statistics on Carcinoma of the Cervix Uteri and Vagina for the Years from 1923 to 1925 (Statistik der Karzinome des Collum uteri und der Vagina aus dem Jahren 1923-1925)  
*Zentralbl f Chir*, 1932, p 212

This is a statistical study of 84 cases of cancer of the uterine cervix and 15 cases of cancer of the vagina which were observed in the Gynecological Clinic of the University of Berlin in the period from January 1, 1923, to September 30, 1925.

Of the cases of cancer of the cervix, 446 were treated. Forty-one per cent were classed as operable, 19 per cent as borderline, and 40 per cent as inoperable. One hundred and sixty-one (36 per cent) were cured. Of the 131 women operated upon by the Wertheim technique, 56.5 per cent are now free from recurrence. Of 315 treated by irradiation, 87 (27.6 per cent) are now free from evidences of cancer. In the 74 operable cases which were treated by irradiation, the incidence of cure was 50 per cent, in the 66 cases regarded as borderline cases, it was 52 per cent, and in the 175 cases which were inoperable, it was 16.6 per cent.

Even though the incidence of cure was higher in the group of operable cases treated by the Wertheim operation than in the similar group treated with radium, the author emphasizes that radium and surgery are not competitive, but supplementary, methods of treatment. In his experience, radium therapy has given better results than combined radium and X-ray irradiation. He is not certain that postoperative X-ray treatment is of any special benefit.

Complicating pregnancy has little effect on cancer of the uterus so far as the end-results are concerned.

The group of 15 cancers of the vagina studied was too small to permit definite conclusions. (G)

Schroeder, R Methods and Results of the Fight Against Gynecological Cancer (Methoden und Erfolge der Krebsbekämpfung in der Gynaekologie) *Strahlentherapie*, 1931, xlii, 358

About three-fourths of all genital cancers are located in the uterine cervix. In 13 per cent, the epithelial proliferation characteristic of cancer of the cervix is localized in the form of exophytic cauliflower-like carcinoma of the portio, in 43 per cent, as endophytic portio carcinoma which eats its way inward and has a tendency to break down superficially, in 9 per cent, as a deeply ingrowing cervical carcinoma, in 19 per cent, as cancer nodules situated deep in the musculature of the cervical canal, and in 16 per cent, as a greatly disintegrated crater following the breaking open of a cervical nodule.

The incidence of healing is about 50 per cent in cases of portio carcinoma, about 30 per cent in those of cervical carcinoma, and only 20 per cent in those of cervical crater. Of 259 women with carcinoma of the cervix who came to the clinic in the period between 1923 and 1926, only 33 are now living and apparently free from carcinoma.

After the Wertheim extended radical abdominal operation and the Schaub extended vaginal total extirpation the incidence of five-year cure without recurrence is about the same, viz, 40 per cent. It therefore seems that the lower primary mortality of from 5 to 6 per cent after Schaub's method as compared with 19 per cent after the abdominal operation is equalized by a higher incidence of recurrence following the former method.

With regard to the results of radium treatment Schroeder states that in inoperable cases freedom from carcinoma for a period of five years can be obtained by radium irradiation in 10 per cent or more. In operable cases treated with radium alone the relative incidence of cure is from 35 to 40 per cent. Radiotherapy also has a primary mortality, Schroeder records 17 primary deaths, a mortality of about 8 per cent, from such conditions as uræmia, hæmorrhage, peritonitis, sepsis, and embolism in 206 cases treated with radium or the roentgen rays. Localization of the cancer in the vicinity of the bladder or rectum renders it less favorable for radium therapy than for operation. The length of time required for radium treatment is often longer than



that required for surgical treatment. The combination of operation and irradiation has great advantages.

However, our chief endeavor must be to bring patients with cancer to treatment earlier than heretofore. In addition to other methods of educating women regarding cancer physicians should hold special discussions on cancer, preferably at meetings of medical societies. Follow-up work is necessary for the early discovery of recurrences, which not infrequently respond well to radiotherapy and to alleviate the condition of incurable patients.

WALTER HAYES (C).

#### ADNEXAL AND PERIUTERINE CONDITIONS

Dorfl, D. The Endothelial Sign in Relation to the Function of the Ovaries (Del segno endotheliale in rapporto alla funzione ovarica) *Folia Gynaecol.* 32, xlv, 17.

The author checked up the Rumpel-Léden endothelial sign in 15 pregnant women, 30 menstruating women, 25 women in the menopause, 33 in the climacteric, 5 with amenorrhea, and 10 with dysmenorrhea from ovarian hypofunction. This sign is the appearance of small capillary hemorrhages in the skin near the elbow or rarely in the skin of the whole lower surface of the forearm, as the result of artificial stasis. The number of hemorrhages is counted. If the hemorrhages are fewer than 10, the test is negative. The technique of the test has been radically modified. The author uses a pressure of 30 mm. Hg greater than the maximal arterial pressure and maintains it for three minutes. From his findings he draws the following conclusions:

1. There is a relationship between the endothelial sign and ovarian function. Hypofunction is accompanied with great frequency by the positive endothelial sign, whereas in normal ovaries (function or hyperfunction of the ovaries) the sign is negative.

2. The endothelial sign as an indication of ovarian hypofunction may be of aid in the diagnosis of the climacteric and disturbances of the menstrual cycle from hypofunction of the ovaries.

3. The practical value of the sign in this respect is limited as there are numerous morbid processes which may affect it and must be excluded in every case before the sign can be regarded as giving conclusive evidence regarding ovarian function. Moreover, there are cases in which the sign is negative in the presence of definite hypofunction of the ovaries.

The author studied also 30 women with ovarian insufficiency who had a strongly positive endothelial sign and to whom he administered ovarian preparations. In 10, the sign disappeared. He therefore believes that the disappearance or weakening of the sign following the administration of ovarian preparations may be used as a criterion of the effectiveness of ovarian opotherapy. The most plausible explanation of the mechanism by which ovarian hypofunction produces a positive endothelial sign is

that endocrine dysregulation causes functional changes in the tone of the endothelial cells through its action on the vegetative nervous system.

EDMOND T. LAMER, M.D.

Beckett, N. B.: Intraperitoneal Hemorrhage of Ovarian Origin. *Am. J. Obs. & Gynec.*, 1921, xviii, 819.

Massive ovarian hemorrhage may be mistaken for misplaced extra-uterine pregnancy unless the clinical history and the social status of the patient are considered.

Discrete ovarian hemorrhage may be mistaken for acute and subacute appendicitis. If the onset of the pain is correlated to the estimated ovulation time and the date of menstruation and if this relation applies to the previous attacks, an ovarian condition may be suspected. A rapid decrease in the total white cell and polymorphonuclear counts and in the sedimentation rate of the erythrocytes indicates cessation of bleeding as well as absorption of the effused blood.

The occurrence of ovarian hemorrhage due to trauma through the vagina is an indication for the correction of retroversion and ovarian prolapse.

E. L. CHAMBLI, M.D.

Lippert, E. H., Baker, A. H., and Vane, D. M.: Granulosa-Cell Tumors of the Ovary. *Proc. Roy. Soc. Med. Lond.*, 25, 127, 121.

Judging from the small number of cases reported in the literature, granulosa-cell tumors of the ovary are comparatively rare. However the authors were able to collect seven cases from one hospital in a period of thirteen years, a fact suggesting that their occurrence is frequent enough to give them a definite clinical importance. The ages of the seven patients ranged from twenty-three to sixty years. Six of the patients have been seen recently and are well. The history of the condition was of several years' duration and characterized by irregular uterine hemorrhages.

In their histological structure and macroscopic appearance the tumors presented many features in common. In size they varied from about 10 by 4 by 7 in. to 4 by 3 by 3 in. The capsule was tough and fibrous and non-adherent to the surrounding structures. On section, the tumors were found to be partly solid and partly cystic. In the solid parts bright yellow patches were often found, and in some of the specimens there was considerable hemorrhage. The macroscopic appearance of the tumors gave no indication of the large number of epithelioid cells found in the sections.

According to the predominating type of arrangement of the epithelioid cells, granulosa-cell tumors of the ovary may be divided into the following three types:

1. The follicular type, characterized by the presence of nests of epithelioid cells varying in size from that of a normal adult graafian follicle to cells three or four times larger.

2 A type in which the epithelioid cells are arranged for the most part in strands or columns. The cells abutting on the connective tissue stroma tend to be cubical or columnar, and there are spaces surrounded by radially arranged cubical cells as in the follicular type of tumor. This type may be termed the "cylindroid type."

3 The mosaic type, in which the epithelioid cells have a much less definite arrangement than in the first and second types and the strands of epithelium form an irregular pattern in a scanty connective tissue stroma.

HARRY W. FINE, M.D.

Róna, A. Ovarian Transplantation (Ueber die Ovarumtransplantation) *Zentralbl. f. Gynaek.*, 1931, p. 3516.

The author reports the results of sixty-four ovarian transplantations which were done in the period from 1924 to 1929. Sixty-one of the operations were autotransplantations and three were homeotransplantations. A large number of the women were re-examined. The shortest period of observation was six months and the longest period was five years. The transplantation was performed extraperitoneally.

In order to judge the results the author classified the cases into three groups. In Group 1 he included cases in which the patient had no uterus and no ovaries besides the transplant. In six of the seven women who were re-examined the climacteric symptoms were not as pronounced as those which generally follow radical operations. However, only one patient remained free from symptoms for as long as a year and a half.

In Group 2 the author included cases in which the uterus was preserved. In none of the thirty-one cases in this group was there any improvement in menstruation after the operation. Only three patients menstruated regularly. Three patients developed complete amenorrhœa. In fourteen cases in which the menses had been normal prior to the operation, disturbances developed which could hardly be controlled medically. In two cases, removal of the transplant, and in three cases, roentgen castration, became necessary.

Group 3 included cases in which only one ovary was removed, a part of this ovary was implanted, and the uterus was present. In these cases the results were more favorable. In seven cases the menstrual cycle was undisturbed, in three, it became irregular, and in five, it became regular after the operation.

In none of these groups could a definite influence upon the libido be demonstrated. Dysmenorrhœa was not markedly affected.

Because of the small number of cases, the author draws no conclusions regarding the homeotransplantations. He explains why the transplanted ovary does not have the same action as the ovary which remains *in situ*. The fact that the follicle fluid reaches a tissue space which is much less resorptive than the peritoneum is undoubtedly of

importance. In two cases in which removal of the transplant became necessary a marked small cystic degeneration of the ovary was found. The function of the transplanted ovary is greatly diminished. In cases of ovarian dysfunction autotransplantation is not indicated. In cases in which both ovaries have been removed the result is very unsatisfactory. A definitely successful result is obtained only in cases in which an ovary capable of function remains *in situ* with the uterus.

E. PHILIPP (G)

## EXTERNAL GENITALIA

Hinselmann, H. A Contribution to the Classification and Derivation of Leucoplakias of the Female Genital Tract (Beitrag zur Ordnung und Ableitung der Leukoplakien des weiblichen Genitaltraktes) *Ztschr. f. Geburtsh. u. Gynaek.*, 1931, 61, 142.

As a basis for a descriptive classification of leucoplakias the author uses the following grouping: (1) atypical cornifying epithelium, (2) atypical cornifying epithelium sprouting into the connective tissue, (3) atypical cornifying carcinoid epithelium, and (4) atypical cornifying carcinoid epithelium with (a) external sprouting and (b) sprouting into connective tissue.

He discusses briefly the opinions of von Franqué and Schiller. He calls attention to the fact that Meyer also considers destructive invasion by no means essential for malignancy. He emphasizes that nearly all malignant changes of the mucous membrane of the female genital tract may be recognized clinically by colposcopy. Occasionally, however, it is necessary in completing the diagnosis to make use of the iodine reaction of Schiller. With these clinical aids we are now able, in a manner not previously thought possible, to detect malignant though not yet destructive mucous membrane changes during life.

While it is evident that cornification plays a definite rôle in leucoplakia, a more important rôle is played by the underlying layers down to the basal cell. The entire mucous membrane is altered and has nothing in common with the normal conditions of the original mucous membrane of the portio or a zone of transformation. It is a unique mucous membrane. Prolapse leucoplakia has not as yet been explained. The leucoplakic epithelium may at times lose its cornified layer (manipulations, cohabitation, menstruation). In leucoplakia of the first and second types cornification and cornification tendency are essential characteristics. In that of the third type the cornification is not always uniformly demonstrable, but is present to such an extent that the carcinoid area may be recognized before the epithelium has spread toward the lumen or into the connective tissue. In leucoplakia of the fourth type the horny layer is almost always lacking as a result of damage to the surface. The certain demonstration of the atypical epithelium in the living woman depends upon colposcopy.

Following this exposition the author discusses the clinical evaluation of colposcopic findings. His efforts to remove carcinomas at an early stage have led him to treat surgically not only cases with the atypical cornifying epithelium of the fourth type, but also those with cornifying epithelium of the third type. However on the basis of the histological findings the leucoplakias of Types 1 and 2 should also be removed.

In conclusion the author states the changes in Types 3 and 4 may be derived from those of Type 1. As he believes this has been definitely proved, he concludes that all of these types may be derived from pre-leucoplakias. Of chief importance is the problem are the mucosa membrane changes preceding the development of leucoplakia.

HARRY O. NEWMAN (C)

Guerra, C.: Chronic Elephantiasic Ulcer of the Vagina and Anus (Its Relation to Lymphogranulomatosis) (Ulceros chronicos elefantiasicos da vagina e do anus: sua relação com a linfogranulomatose). *Rev. de ginec. e obstet.* 23, xxvi.

The author reports fifteen cases of chronic elephantiasic ulcer of the vagina and stricture of the anus and abstracts briefly the histories of eighteen others. A diagnosis of lymphogranulomatosis was made on the basis of the exclusion of other diseases, a positive Fred reaction, and the histological picture. The treatment indicated in this condition is intra-venous iodine medication, Paquet's cauterization or diathermy coagulation, dilatation of strictures, and the administration of toxics. In some cases

improvement results, but the author has never seen a complete cure. ALBERT GORE MORGAN, M.D.

# MISCELLANEOUS

Cortés, J. N.: The "Periphereal Heart" (An Abnormality of the Female Genitalia (II "corazón periférico" and "arteria morboza del genitio femenino"). *Rev. del 6º ginec.*, 1933, xix, 533.

The author studied the variations in the peripheral blood pressure associated with different diseases and abnormalities of the female genitalia. As a rule he measured the humeral, radial, and tibial pressures.

In cases of fibrosis of the uterus there was slight hypertension which was most marked in the lower extremities. Removal of the tumor resulted in gradual restoration of the pressure to normal. Subsequent cessation of ovarian function did not seem to have any effect on the pressure after the operation.

In cases of malignant tumor there was a more marked increase in the pressure, especially in the lower extremities.

In cases of ovarian cyst the humeral pressure remained unchanged whereas the tibial pressure was increased. The author believes that the increase in the tibial pressure was produced mechanically rather than by the toxic action of a substance absorbed from the cyst.

In cases of inflammation of the adnexa there was a tendency toward hypotension in the humeral arteries with relative hypertension in the lower extremities.

A LOUIS ROSE, M.D.

# OBSTETRICS

## PREGNANCY AND ITS COMPLICATIONS

Serebroff, A. I. How Should Tubal Pregnancy Be Operated Upon? (Auf welche Weise ist die Tubenschwangerschaft zu operieren?) *Arch f Gynaek*, 1932, cxviii, 364

Of 1,575 women subjected to laparotomy in the gynecological section of the Snegireff Obstetrical Institute in Leningrad in the period from 1923 to 1929, 425 (27 per cent) were operated upon for extra-uterine pregnancy, and of the latter, 22 had been operated upon previously for extra-uterine pregnancy. Eleven of the 425 women died.

Of 167 women who had a unilateral salpingectomy for tubal pregnancy and were considered capable of pregnancy thereafter, 97 answered a questionnaire. Of these, 16 (16.5 per cent) reported that they had been operated upon again for tubal pregnancy. Two others had had symptoms of another tubal pregnancy, but these had ceased spontaneously. Eighteen had borne a child, and 13 had had an abortion. Fifty (52 per cent) had not become pregnant again. Of 10 who used contraceptives, 7 became pregnant.

Since after an operation for tubal pregnancy fertility is reduced and the incidence of uterine pregnancy is only twice that of extra-uterine pregnancy, the author concludes that it is usually advisable to remove both tubes at the same operation. Only in the cases of women with sterility in youth and a great desire to have children should one tube be preserved. In some cases a salpingostomatoplastic operation should be performed. However, the incidence of recurrent extra-uterine pregnancy is so high that there is danger of its occurrence even when the remaining tube appears macroscopically normal.

H. H. SCHMIDT (G)

Fournier, R. A Contribution to the Study of the Circulation in the Normal and Pathological Placenta. Roentgenographic Method (Contribution à l'étude de la circulation dans le placenta normal et pathologique. Méthode radiographique). *Gynec et obst*, 1932, xxv, 349.

Fournier has made a roentgenographic study of the circulation in 150 placenta of all ages. These were divided into the following 2 groups: (1) normal placenta, which included those at term and at different periods of pregnancy, and (2) pathological placenta, which included those attacked by pathological processes in women who were clinically normal, placenta from women with nephritis, and syphilitic placenta.

In preparing the specimens Fournier removed as much blood as possible by careful massage and removed the remainder by washing with water.

The placental vessels, usually the arteries, were then injected with double strength mercury ointment (recommended by Bousson) which was heated to 40 degrees C so that it would reach the finest capillaries. The injection was continued until the maternal surface of the placenta was a uniform green color, which signified that the entire arterial tree was completely filled. The specimen was then cooled and hardened in 4 per cent formalin for twenty-four hours. The roentgenograms were made with the maternal surface of the placenta against the plate to bring out the capillary details, and with a distance of 80 cm, 200 ma, and 50 kv.

The article contains reproductions of numerous roentgenograms. Fournier found that in normal placenta the vascular tree is characterized by regularity and uniformity of distribution of terminal capillary "bouquets." In the young placenta the pattern is of the same type, but there is a somewhat less rich vascular tree. In old placenta histological examination shows vascular lesions, but these do not produce significant changes in the vascular tree.

Degenerative lesions in the vascular tree found in placenta obtained from women who were clinically normal were always found to correspond to true pathological lesions.

In cases of eclampsia, nephritis, and syphilis, extremely variable, yet characteristic, alterations were found in the vascular tree. In some cases of nephritis and syphilis in which the vascular tree appeared normal death of the infant was caused by the maternal toxæmia and infection. However, if the child remained alive a sufficient number of cotyledons remained normally vascularized to assure its nutrition, regardless of the cause or gravity of the maternal infection. The roentgenograms of placenta obtained from women suffering from chronic nephritis, eclampsia, and syphilis were sufficiently characteristic in each condition to permit their ready differentiation. The vascular lesions of slow prolonged nephritis attack the terminal capillaries and produce progressive obliteration of the circulation throughout the placental mass. The attempt to force blood past these barriers produces a mechanical dilatation of the arterioles and arteries upward toward the capillary bouquets. This picture is clearly shown by the roentgenogram. The author has never seen it except in chronic nephritis.

In eclampsia the thromboses appear quickly and obliterate important vessels in the placenta. When a certain percentage of placental vessels are involved death of the infant results very quickly. There is no increase in the caliber of the arteries such as occurs in chronic nephritis. When chronic nephritis is the cause of eclampsia the pictures of the 2 conditions are superimposed.

The treponema travels throughout the placenta and attacks capillaries and subamniotic vessels, causing progressive narrowing due to an obliterative endarteritis and periarthritis. It attacks most frequently the small and medium-sized arteries. Areas of involvement are interspersed with almost normal appearing areas of terminal capillary bouquets.

In conclusion Fournier says that roentgenographic studies give a complete image of the placental circulation and the changes produced by disease. In most cases the clinical and laboratory findings are of greater importance, but when these findings do not aid in the diagnosis roentgen studies are of special value.

JAMES B. MARSH, M.D.

Halshofer, L.: Investigations of the Joints of the Pelvis, With Special Consideration of Changes During Pregnancy and Labor (Untersuchungen über die Gelenke des Beckens mit besonderer Berücksichtigung ihrer Veränderungen durch Schwangerschaft und Geburt). *Arch. f. Gynäk.* 93, 1912, 69.

The author reports a study made with numerous microscopic sections of the pelvis of pregnant women as compared with those of children, non-pregnant women, and men. The symphysis was examined in eighty-nine cases and the sacro-iliac joint in sixteen.

He found that the individual differences are much greater between the amphiarthroses than between the diarthroses, especially in adults. In the symphysis and the sacro-iliac joints articular spaces are present in adults as well as in children and fetuses. Heretofore the mobility of these joints was often underestimated. An increase in mobility during pregnancy is not explained by an increase in the fluids as the latter is regarded as a cause of increased fragility. The increased mobility is explained better by changes of posture and function. This is proved by the occurrence of similar changes in men during heavy labor. The movement causes friction and the accumulation of particles within the joints which, with continuous recurrence, accumulate into peculiar layers. The movement is demonstrated also by T shaped fissures and "planed" areas in the symphysis. Very striking are the nearly always demonstrable pathological changes of traumatic origin and of osteoarthritis. With equal frequency pressure and trauma cause very small fissures and splinters, fractures, callus, and areas of rarefaction such as are very often discovered in children.

A series of changes at the osteocartilaginous borders are described. Besides very slight traumatic disturbances and callus formations there may often be larger lesions, irregular fissures and calluses, fibrous, mucous, and fatty changes, calcification, and necrosis of the cartilage matrix cells. The softening and hyperemia occurring during pregnancy increase the susceptibility to trauma, as is shown by microscopic examination.

The findings in osteo-arthritis deformans are described with illustrations. This condition is characterized by the penetration of bony processes

into the cartilage flaps, and areas of resorption invaded by marrow tissue, which Fournier considered characteristic. Arthritis deformans may occur also in young persons and must not be confused with the normal growth processes in which the calcification zone of the cartilage is not invaded by marrow tissue and irregularly penetrated as far as the uncalcified cartilage.

In multiparous women extensive changes with marked loss of intermediate cartilage and fissures in the joint cartilage are found. The pelvis is widened. The temporary broadening of the pelvis during pregnancy and labor is shown by roentgenogram and by sections through the joints. The extensive fissures and regressive changes are revealed by the ragged appearance of the borders of the joint space. Some time after delivery the joint walls again become smooth and approach each other more closely with removal of the split portions of cartilage and the unusual accumulation of debris at the ends of the clefts. Fresh hemorrhages may occur in the cavity of the sacro-iliac joint, and varying amounts of blood residue may remain in the fissures. In three cases seen by the author—one of trauma and two of pregnancy—the hemorrhages were particularly severe. Eysner and Lang found remains of hematoma most frequently in the sacro-iliac joint. The hemorrhages were ascribed to stasis.

Clinically the changes described are manifested by sacral pain. The sacro-iliac joints are rendered painful by the variations in weight-bearing which occur during pregnancy by inflammation, particularly that of deforming arthritis and by traumatic changes, as the result of which arthritis deformans frequently occurs.

ROBERT MINTZ (U).

Cornell, E. L.: The Value of Kidney Visualization in Pregnancy. *Am. J. Obst. & Gynec.* 1912, 123, 755.

Normal pregnant women, who have no complaints referable to the urinary system, may show a marked dilatation of the right ureter. This is often accompanied by kinks in the upper half of the ureter. The roentgenogram suggests that the kinks are more than twists. In some cases they seem to be reduplications, and in others more or less right angled foldings. The author's studies revealed no strictures in the ureter and no evidence of stone. The left ureter becomes dilated much less frequently than the right ureter and shows kinks only occasionally. Dilatation of the right ureter is evident after the third month.

In the cases studied by the author the ureters became visible to the level of the fifth lumbar vertebrae, but were seldom seen lower. All cases of hydronephrosis showed hydro-ureters. The bladder was saddle shaped, whether the baby lay in a breech or a cephalic presentation, and the saddle shape was seen as early as after two and a half months.

The drug used in all cases was skiodon. The dose employed was 30 gm. dissolved in 50 c.c.m. of sterile water.

The pathological kidney becomes visible more slowly and retains the opaque material much longer than the normal kidney. In the author's studies good shadows of the pathological kidney were seen as long as three hours after the injection. The visibility of the normal kidney was best ten minutes after the injection.

Fauvet, E. Hormones of the Posterior Lobe of the Pituitary Gland and Toxæmias of Pregnancy (Hypophysenhinterlappenhormone und Schwangerschaftstoxikosen) *Klin Wchnschr*, 1931, II, 2125

Hydrops gravidarum, nephropathy, and eclampsia should be designated as gestation toxæmias brought about by the active principles of the posterior lobe of the pituitary gland. They occur only in association with pregnancy and their cause has long been sought in the maternal organism.

A certain degree of tissue succulence is physiological in pregnancy. During pregnancy there is also an abundant secretion of pituitary substances. The water and the sodium chloride balance is influenced to a remarkable degree by the hormones of the posterior lobe of the pituitary gland, diuresis being checked and chloride excretion being increased. It is assumed that in the regulation of the water balance during pregnancy an effect is exerted upon the tissues by the posterior lobe of the pituitary gland which is physiological up to a certain degree. When overproduction of the hormone of the posterior lobe of the pituitary gland begins retention of water within the tissues, hydræmia, results and a less concentrated urine is excreted. The opposite condition, i.e., under-production of the hormone of the posterior lobe of the pituitary gland, causes concentration of the blood, dehydration of the tissues, polyuria, and the symptoms of diabetes insipidus. The symptoms of over-production of the hormone correspond to the cardinal symptoms of hydrops gravidarum. Therefore hydrops gravidarum may depend upon an increased production of the hormone of the anterior lobe of the pituitary gland.

According to Zangemeister, the second stage of hydrops gravidarum is characterized by the nephropathy syndrome. This syndrome was studied by the author by means of experiments on animals based upon the investigations of Ehrhardt and Simunich in which intoxication was produced by extract of the posterior lobe of the pituitary gland. The active component of this extract is tonephin. In his experiments the author found that it is possible to produce the changes characteristic of nephropathy by means of the active principle of the posterior lobe of the pituitary gland.

Eclampsia is a more advanced grade of nephropathy with increased blood pressure and convulsions. An increase in the blood pressure as well as convulsions may be produced by intoxication with extracts of the posterior lobe of the pituitary gland. While in experiments on animals the changes characteristic of eclampsia could not be produced exactly, the author found evidence to prove that by intoxication with

extracts of the posterior lobe of the pituitary gland it was possible to produce disease pictures which corresponded fully from an anatomico-pathological standpoint to those observed in eclampsia.

The results of research regarding the anterior lobe of the pituitary gland have led to the author to believe that hypersecretion of the hormone of the posterior lobe of this gland is possible during pregnancy, and that this hormone may be produced also in large quantities by the placenta.

There is no perfect pharmacological method for demonstrating the presence of this hormone. The melanophore reaction merely indicates the presence of tonephin, the component of the extract of the posterior lobe of the pituitary gland which influences renal function and water balance. Since Ehrhardt could produce the melanophore reaction only by implantation of placental tissue from eclamptics, the author believes it justifiable to conclude that in the presence of œdemklose (a term coined by Seitz to signify the œdema-nephrosis-eclampsia syndrome) there is a pathological increase in the production of the secretions of the posterior lobe of the pituitary gland. As an indirect proof of this theory he cites the results obtained in the treatment of eclampsia with narcotics. Narcotics counteract the effects of the extract of the posterior lobe of the pituitary gland. The results of pharmacological experiments support the assumption that there is an increased production of active principles in the hypothalamus. H. SIEGHEVO (G)

Klaften, E. Eclampsia and the Vascular System (Eklampsie und Gefässsystem) *Klin Wchnschr*, 1931, II, 1627

The author has continued the investigations of Pál concerning hypertonia and hypertension and their importance in the pathogenesis of the toxæmias of pregnancy.

Hypertonia and hypertension must not be considered identical. The author distinguishes 4 distinct groups of cases. The first group includes cases with functional disturbances of the vascular system (hypertonia). The 2 chief types are primary and toxicogenic hypertonia.

In 500 cases of eclampsia Klaften found 17 cases of primary hypertonia. These cases are characterized by an increased resting tonus of the cells of the muscular wall of the blood vessels which results in permanent hypertension. The veins are normal. The retina shows a typical thickening of the arteries and a reduction in the size of the veins at the points of crossing (Gunn's sign). There is a tendency toward sudden variations in the blood pressure and toward angiospastic states in the cerebral vascular system.

Toxicogenic hypertonia tends more toward the development of œdema and albuminuria progressing to the stage of eclampsia. The vascular system shows damage to the arteries and veins with concentric hypertrophy of the heart. These cases may be differentiated only by thorough clinical investi-

gation of the entire vascular system, including capillary microscopy. Changes in the retina and cork-screw-like convolutions of the veins are common. A history of scarlet fever is of importance as toxicogenic vessel changes frequently result from this condition, and women showing such changes later tend to develop nephropathies. Of greatest importance among cases of toxicogenic hypertension are those with renal changes.

Besides these 2 groups of cases there are the cases of elderly women with worn-out vessels, hypoplasia due to constitutional alterations of the cardiovascular system and atherosclerotic changes. In hypoplasia the vascular system does not respond adequately to the increased functional demands of pregnancy. The vessels are extraordinarily labile. The congenital narrowness of the vascular system, the small size of the aorta and the inefficient heart not infrequently constitute the basis of subsequent eclampsia.

While the author's cases included 7 of the first type of primary hypertension described, toxicogenic hypertension was found in 14 and atherosclerosis in 5. In 463 cases vessel changes could not be demonstrated. It is noteworthy that of the 10 cases of eclampsia observed, 2 belonged to the group of primary hypertension and 3 to the group of toxicogenic hypertension. In 5 cases the vascular system was normal, but 4 of the 5 patients were under twenty-three years of age. Conditions were similar in the 5 cases of nephropathy. In only 1 was it impossible to discover vascular changes.

The author is of the opinion that the classification of cases according to vascular changes is of practical importance for therapy. Primary and toxicogenic hypertension with vascular hypoplasia and atherosclerosis must be diagnosed early and subjected to prophylactic treatment. Limitation of the protein and sodium chloride intake and shortening of the process of labor are of importance. In the purely toxicogenic types of hypertension venesection is indicated, but in the remaining types it is contraindicated because of the danger of producing pressure variations in the vascular system.

KROEMER (G.).

Held, E.: Severe Pyelitis During Pregnancy (Pyelitis grandiosae graves). *Gynäk. u. gebn.* 93: 227, 1906.

Every case of pyelitis during pregnancy requires strict control of the function of the kidneys as shown by clinical signs and laboratory procedures (blood urea determinations, diuretic test, concentration test). Cylindruria is not to be interpreted as an early sign of renal insufficiency. The physician must recognize the extent of the infection. Repeated blood cultures in the interval between chills give valuable information supplementing the clinical signs and symptoms as regards sepsis.

The author employs intravenous pyelography regularly and considers this procedure indispensable in all cases which resist treatment. He calls atten-

tion to the presence of icterus and mild cyanosis which he has observed repeatedly even in mild cases of colon bacillus infection.

All cases should first be treated medically (urinary antiseptics, the intravenous administration of hypertonic glucose, etc.). When medical measures fail, the renal pelvis should be drained for a period of several days and bacteriophage should be instilled into it. This treatment is rendered more efficacious by injections of Vincent's anti-colic serum. When drainage fails to bring about prompt resolution of the septic phenomenon and when there is evidence of renal insufficiency which does not respond rapidly to medical treatment, the author advises surgical intervention. If the process is unilateral nephrectomy is to be preferred. When both kidneys are involved the pregnancy should be terminated. In the second half of pregnancy hysterotomy by the abdominal route is advised, but in the first half of pregnancy therapeutic abortion by the vaginal route is associated with less risk. As prolonged renal infection is a grave source of danger to both the mother and the child, prompt interruption of the pregnancy is indicated when all attempts at treatment have failed.

The author reports three cases of severe pyelitis during pregnancy. HANCOCK C. BLACK, M.D.

Warner, C. G., and Elliott, J. T.: Symmetrical Cortical Necrosis of the Kidneys in Pregnancy. *Am. J. Obst. & Gynec.* 1932, 22: 875.

Cortical necrosis of the kidneys has been known to develop during the course of infectious diseases in both sexes, even in children, but in by far the majority of the forty cases reported in the literature it occurred in women after the fourth month of pregnancy and following some complication of pregnancy usually retroplacental hemorrhage. In only one instance was the fetus born alive. In this case twins were delivered. There may be no antecedent history or clinical signs suggesting renal involvement, but as a rule more or less marked edema precedes the urinary suppression. Anuria is one of the most constant signs, and is usually complete or practically complete. It begins several days before or after delivery and continues until death. Sweating is not the rule. Gradually increasing nitrogen retention with a rather rapid accumulation of creatinin is an outstanding feature, as pointed out by Shriver and Ostel.

Repeated determinations of the blood pressure have been made in only a few cases. The pressure tends to drop with the progress of the disease, but whether the fall has a cause or is an effect relating to the renal condition cannot be determined.

The symmetrical character of the necrosis clearly indicates that the pathological changes have a circulatory basis, but whether the vascular lesion is a thrombosis, embolism, or vasoparalysis with stasis has not been definitely proved. Without doubt, thrombi are present in the majority of the arterioles in the necrotic cortex of the kidney. The thrombi

occurs only in the segmentary level of cortical necrosis

The authors report a case in detail

E L CORNELL, M.D

Baer, J L, Reis, R A., and Arens, R A Appendicitis in Pregnancy *J Am M Ass*, 1932, xcviu, 1359

Seventy pregnant women with normal appendices were studied roentgenologically in the dorsal position at regular intervals throughout pregnancy and the puerperium. In each instance the relationship of the base of the appendix and the caput coli to fixed anatomical structures easily recognized on the fluoroscopic screen and in the roentgenogram was noted. The base of the appendix was measured in relation to the iliac crest, the iliopectineal line at its sacral termination or the symphysis pubis rather than to McBurney's point as the latter varies as pregnancy progresses

It was found that the long axis of the appendix undergoes a counterclockwise rotation, first becoming horizontal and pointing medially and finally, in 60 per cent of cases, pointing vertically at the end of the eighth month. By the end of the tenth day after delivery the appendix has returned to its normal position. In many instances it is lower than normal at this time, probably because of the general abdominal relaxation

Twenty-eight cases of appendicitis complicating pregnancy were studied. These occurred among 16,543 cases of delivery, an incidence of 0.17 per cent, and among 1,700 appendectomies in adult women, an incidence of 1.7 per cent. In 50 per cent the onset occurred during the second trimester of pregnancy

All types of pathological change showed a frequency comparable to their incidence in the absence of pregnancy except gangrenous and perforative appendicitis, which occurred  $5\frac{1}{2}$  and  $3\frac{1}{2}$  times more frequently, respectively, in the presence of pregnancy. The condition is often not recognized in the early stages because the abdominal pain, nausea, and vomiting are interpreted as the usual accompaniment of advancing pregnancy

Abortion and premature labor are most apt to occur when the infection invades the peritoneal cavity. The later the onset of the appendicitis in the course of the pregnancy the greater the danger of premature labor

There is only one treatment for the condition, viz., prompt surgical removal of the appendix. The pregnancy should be left undisturbed regardless of its stage or the severity of the appendiceal involvement.

CHARLES BARON, M.D

Bir6, S Cancer of the Uterus and Pregnancy (Gebärmutterkrebs und Schwangerschaft) *Monatsschr f Geburtsh u Gynaek*, 1931, lxxxix, 275

In the eleven and a half years from January 1, 1918 to June 30, 1929, a complicating carcinoma of the cervix was found in only 10 of 21,331 cases of

delivery and miscarriage at the Second Gynecological Clinic of the University of Budapest. To these the author adds a case of carcinoma of the vagina because of its similar treatment and significance

In general, women with carcinoma complicating pregnancy consult a physician sooner than those with carcinoma of the uterus not complicating pregnancy. Therefore the condition of the former is more frequently operable when the case is first seen. All of the cases reviewed by the author were operable. Only one patient died as the direct result of the operation. Two developed recurrences later. The incidence of cure was 67 per cent. With regard to the treatment the author concludes as follows

"In operable cases a radical operation should be performed immediately. In the early stages of pregnancy a vaginal operation, and in the later stages, an abdominal operation, should be performed. The operation may be postponed in the interests of the fetus only a few weeks at the most. In inoperable carcinoma the pregnancy should be interrupted in the first few months by supravaginal amputation of the uterus. At the end of pregnancy one should wait until the fetus is viable. Cesarean section should then be done and followed by supravaginal amputation of the uterus and postoperative irradiation

WILLE (G)

## LABOR AND ITS COMPLICATIONS

Keller, R, and Bohler, E Clinical Experiences with Pernocton Anesthesia in Obstetrics (Expériences cliniques sur l'anesthésie obstétricale au pernocton) *Gynec et obst*, 1932, xxi, 191

The authors have employed pernocton anesthesia in 150 obstetrical cases. As the period of amnesia following the administration of this drug is relatively brief, an anesthetic effect is obtainable only during the time of expulsion and a very brief portion of the first stage. As pernocton does not exert an unfavorable influence on the course of labor, but, on the contrary, often appears to accelerate the period of dilatation, frequent injections may be made during the first stage. The second stage is usually not prolonged. The administration of pernocton does not predispose to uterine atony. Its effect in producing amnesia and anesthesia is superior to that of other obstetrical anesthetics. However, contrary to the opinions of others, the authors have found that it has a definite toxic effect on the fetus

The chief disadvantages of pernocton anesthesia are (1) the frequency of excitation phases, which vary in intensity and cannot be counteracted, (2) the necessity for close supervision of the patient during the second stage, which increases the work of the attending personnel, and (3) the brevity of the period of amnesia. While improvements in technique may prolong the period of amnesia it remains questionable whether this can be accomplished without increasing the danger to the mother and child

Pernocton anesthesia can be used safely only in a well-organized hospital in which constant medical



gation of the entire vascular system, including capillary microscopy. Changes in the retina and corkcrew like convolutions of the veins are common. A history of scarlet fever is of importance as toxicogenic vessel changes frequently result from this condition and women showing such changes later tend to develop nephropathies. Of greatest importance among cases of toxicogenic hypertension are those with renal changes.

Besides these 2 groups of cases there are the cases of elderly women with worn-out vessels, hypoplasia due to constitutional alterations of the cardiovascular system and atheroscleromatous changes. In hypoplasia the vascular system does not respond adequately to the increased functional demands of pregnancy. The vessels are extraordinarily brittle. The congenital narrowness of the vascular system, the small size of the aorta, and the inefficient heart not infrequently constitute the basis of subsequent eclampsia.

While the author's cases included 17 of the first type of primary hypertension described, toxicogenic hypertension was found in 14 and atherosclerotic in 5. In 404 cases vessel changes could not be demonstrated. It is noteworthy that of the 10 cases of eclampsia observed, 5 belonged to the group of primary hypertension and 5 to the group of toxicogenic hypertension. In 5 cases the vascular system was normal, but 4 of the 5 patients, were under twenty three years of age. Conditions were similar in the 5 cases of nephropathy. In only 5 was it impossible to discover vascular changes.

The author is of the opinion that the classification of cases according to vascular changes is of practical importance for therapy. Primary and toxicogenic hypertension with vascular hypoplasia and atherosclerosis must be diagnosed early and subjected to prophylactic treatment. Limitation of the protein and sodium chloride intake and shortening of the process of labor are of importance. In the purely toxicogenic types of hypertension venesection is indicated, but in the remaining types it is contra indicated because of the danger of producing pressure variations in the vascular system.

KIMURA (G)

Held, E.: Severe Pyelitis During Pregnancy (Pyelites gravidicae gravis). *Gynec. et obst.* 1933. 329, 306.

Every case of pyelitis during pregnancy requires strict control of the function of the kidneys as shown by clinical signs and laboratory procedures (blood urea determinations, diuresis test, concentration test). Cystinduria is not to be interpreted as an early sign of renal insufficiency. The physician must recognize the extent of the infection. Repeated blood cultures in the interval between chills give valuable information supplementing the clinical signs and symptoms as regards sepsis.

The author employs intravenous pyelography regularly and considers this procedure indispensable in all cases which resist treatment. He calls atten-

tion to the presence of icterus and mild cyanosis which he has observed repeatedly even in mild cases of colon bacillus infection.

All cases should first be treated medically (urinary antiseptics, the intravenous administration of hypertonic glucose, etc.). When medical measures fail, the renal pelvis should be drained for a period of several days and bacteriophage should be instilled into it. This treatment is rendered more efficacious by injections of Vacent's anti-colic serum. When drainage fails to bring about prompt resolution of the septic phenomena and when there is evidence of renal insufficiency which does not respond amply to medical treatment, the author advises surgical intervention. If the process is unilateral nephrectomy is to be preferred. When both kidneys are involved the pregnancy should be terminated. In the second half of pregnancy hysterectomy by the abdominal route is advised, but in the first half of pregnancy therapeutic abortion by the vaginal route is associated with less risk. As prolonged renal infection is a grave source of danger to both the mother and the child, prompt interruption of the pregnancy is indicated when all attempts at treatment have failed.

The author reports three cases of severe pyelitis during pregnancy. HANCOCK C. MACC, M.D.

Warner, C. G., and Hibbits, J. T.: Symmetrical Cortical Necrosis of the Kidneys in Pregnancy. *Am J Obst & Gynec.* 95, 222, 375.

Cortical necrosis of the kidneys has been known to develop during the course of infectious diseases in both sexes, even in children, but in by far the majority of the forty cases reported in the literature it occurred in women after the fourth month of pregnancy and following some complication of pregnancy usually retroplacental hemorrhage. In only one instance was the fetus born alive. In this one twin was delivered. There may be no antecedent history or clinical signs suggesting renal involvement, but as a rule more or less marked edema precedes the urinary suppression. Anuria is one of the most constant signs, and is usually complete or practically complete. It begins several days before or after delivery and continues until death. Urinary retention is not the rule. Gradually increasing nitrogen retention with a rather rapid accumulation of creatinin is an outstanding feature, as pointed out by Sklarver and Oertel.

Repeated determinations of the blood pressure have been made in only a few cases. The pressure tends to drop with the progress of the disease, but whether the fall has a cause or an effect relationship to the renal condition cannot be determined.

The symmetrical character of the necrosis clearly indicates that the pathological changes have a circulatory basis, but whether the vascular lesion is a thrombosis, embolism or vasospasm with stasis has not been definitely proved. Without doubt, thrombi are present in the majority of the arterioles in the necrotic cortex of the kidney. The thrombosis

by intervention Of those who had been delivered spontaneously, only 33 had an afebrile puerperium Of 48 with puerperal sepsis, 10 died, and of 16 subjected to manual removal of the placenta, 5 died.

A comparison of the 2 groups supports the opinion that all women should be delivered in a hospital Puppel considers this conclusion too radical, but believes that all practitioners should be obliged to have three months' training on an obstetrical service

In the discussion of this report attention was called to the fact that the absolute and puerperal morbidity remained unchanged up to the year 1923 After that year the patients were allowed to get up early and it was found that early activity of the puerperal woman is most important

ODENTHAL (G)

Stookey, P F, and Downs, C M Some Observations Concerning Erythematous Eruptions Simulating Scarlet Fever Developing in the Puerperium *Am J Obst & Gynec*, 1932, **xxiii**, 735

It is obvious that scarlet fever may attack women in the puerperium, but in the author's experience scarlet fever developing in the puerperium is puerperal infection due to a streptococcus producing an exotoxin capable of causing an erythematous eruption. This streptococcus may invade the blood stream and produce the clinical picture of puerperal sepsis with a high mortality In some cases the infection may be confined to the uterus, the constitutional reaction being slight and the associated erythematous eruption due to the absorption of the erythema-producing exotoxins In this group the prognosis is excellent.

The rôle of Dick's streptococcus scarlatina in the production of puerperal infections associated with erythema cannot be definitely established. However, the exotoxin elaborated by a streptococcus grown from the blood of women with puerperal sepsis associated with an exanthem which cannot be differentiated from that of scarlet fever produces a characteristic reaction in Dick-positive persons, and exotoxins from the streptococcus producing an erythematous eruption like that of scarlet fever in the puerperium are neutralized by Dick's antitoxin The therapeutic efficiency of the antitoxin is in direct proportion to the exotoxin elaborated The authors conclude that neutralization of this erythema-producing exotoxin of streptococcal origin may be of great therapeutic importance

E L CORNELL, M.D

#### MISCELLANEOUS

Solomons, B Report of the Rotunda Hospital, November 1, 1930 to October 31, 1931

During the year from November 1930 to November 1931 there were 2,571 admissions to the Rotunda Hospital, Dublin, and 2,169 deliveries There

were 1,814 cases on the district with 1,705 deliveries Nineteen maternal deaths occurred in the hospital and 2 on the outside service

There were 19 cases of eclampsia with 1 maternal death and 8 fetal deaths

In 24 cases of placenta prævia there were 2 maternal deaths and 12 fetal deaths However, previous to the first death there had been a series of 78 cases of placenta prævia without a maternal death Therefore in a period of five years there were 102 cases of placenta prævia with only 2 maternal deaths

The incidence of disproportion was decreased from 109 cases in the previous year to 69 cases The results in the cases of disproportion and the type of treatment used were as follows

Type of delivery	Cases	Maternal deaths	Fetal deaths
Spontaneous	31	0	3
Forceps	12	0	4
Versions	2	0	0
Cæsarean section	2	0	0
Operative destruction	2	0	2

There were 3 cases of rupture of the uterus, all those of multiparæ, with 1 death

Accidental hæmorrhage occurred 34 times with the death of 1 mother and 19 babies

There were only 8 primary cæsarean sections and 1 postmortem section with the delivery of a live baby following sudden death of the mother after the injection of stovaine for the induction of spinal anaesthesia Of the 8 primary cæsarean sections, 3 were classical and 5 were lower segment operations There were 17 repeated sections Of these, 10 were classical operations, 1 was a Porro operation, and 3 were lower segment operations The type of 3 is not stated Six vaginal deliveries after cæsarean section are reported Four of the operations in these cases were lower segment procedures and 2 were classical operations

The incidence of forceps delivery was 5.34 per cent In 55 of the 116 cases, the forceps were used because of fetal distress

Induction of labor was done 138 times The method employed most frequently was rupture of the membranes

There were 50 cases of breech presentation, 7 cases of face presentation, all ending in spontaneous delivery, and 7 cases of persistent occiput-posterior position Solomons believes that occiput-posterior position is best left alone Eight cases of prolapse of the cord were reported

The maternal mortality was 0.87 per cent, and the maternal morbidity according to the B M A standard was 4.3 per cent

CHESTER C DOHERTY, M.D

observation of the patient is possible. As a form of twilight sleep it possesses great advantages over former methods. As its disadvantages are common to all other types of anesthesia the authors believe they can never be eliminated entirely.

In conclusion the authors state that despite the advances made by the introduction of punction, the problem of twilight sleep in obstetrics still awaits an ideal solution.

HAROLD C. MACC, M.D.

D. Aclerno, P.: The Lower Segment Cesarean Section, or Cello-Isthmotomy. A Preliminary Report. *Am J Obst. & Gynec.*, 1933, vol. 18, 1.

Experimental and surgical evidence shows that an incision 15 cm. long or longer is necessary for the delivery of the head of the average full-term child.

A longitudinal incision in the lower segment of the uterus is therefore inadequate and a transverse curvilinear incision must be employed if the operative field is to be limited to the quiet zone. As this zone is represented by the isthmus, the operation may be appropriately called cello-isthmotomy.

The author describes the technique of "cello-isthmotomy" in detail. Transverse cello-isthmotomy seems to possess decided anatomical, physiological, and technical advantages over longitudinal cello-isthmotomy.

Fourteen longitudinal and six transverse cello-isthmotomies are reviewed briefly for comparison. In neither group were there any deaths. The morbidity was 57 per cent in the cases in which the longitudinal operation was done and 50 per cent in those in which the transverse operation was done although the number of poor risks was larger in the latter.

E. L. CORCORAN, M.D.

Mayer, H. W.: Maternal Mortality and the Mercurochrome Technique. *Am J Obst. & Gynec.* 1932, vol. 15, 637.

In a study of the maternal mortality following 15,647 deliveries the cases were divided into 3 groups of approximately 5,000 each. In the first group, which represented the period from 1919 through 1924, no vaginal antiseptic was used. In the second group, which represented the period from 1925 through 1927, mercurochrome was used experimentally. In the third group, which represented the period from 1928 to August, 1930, the latest mercurochrome technique was employed.

In the 5,000 deliveries before the use of mercurochrome there were as many maternal deaths as in the 10,000 deliveries following the use of mercurochrome.

If the cesarean sections are left out of consideration, there were twice as many maternal deaths in the first 5,000 deliveries as in the last 5,000, and in cases of vaginal delivery of viable infants there were 4 times as many maternal deaths in the first series as in the last series.

The mortality of cesarean section in the first group was 7.1 per cent, and in the second and third groups, 2.6 per cent.

Shock and hemorrhage accounted for 8 deaths in the first series, 2 in the second, and 3 in the third.

In the cases of the first group eclampsia was given as the cause of 3 maternal deaths following the vaginal delivery of a viable child and of 4 deaths following cesarean section. In the cases in which mercurochrome was used there was only 1 death from eclampsia following the vaginal delivery of a viable child.

Sepsis was the cause of 15 deaths in the first group, 9 in the second, and 4 in the third.

In the cases of vaginal delivery of viable infants there were 6 deaths from puerperal sepsis in the first group, 8 in the second, and 1 in the third. Following cesarean section, there were 7 deaths from sepsis in the first group, 1 in the second, and 1 in the third.

In the last group only 1 of the deaths followed the vaginal delivery of a viable child. Another followed cesarean section. The third was that of a woman who was infected before her admission to the hospital and had a miscarriage after five and a half months.

In conclusion the author says that as puerperal sepsis accounts for from one-third to one-half of all maternal deaths and is a preventable condition in which there has been no increase during the last twenty-five years, it is logical to assume that the use of a vaginal antiseptic during labor and delivery might reduce the number of maternal deaths from this cause.

E. L. CORCORAN, M.D.

## PUERPERIUM AND ITS COMPLICATIONS

Puppel: Puerperal Fever at the Institute for Midwives in Mainz in the Period from 1913 to 1928 (*Die Puerperalfieberfälle in der Hebammenanstalt Mainz 1913-1928*). *Arch. f. Gynäk.* 1931, vol. 346.

In the period from 1913 to 1928 about 13,000 women were delivered at the Institute for Midwives at Mainz. Of the total number of 19,831 deliveries 11,300 (56 per cent) were spontaneous and 8,530 (43 per cent) were operative. Fever occurred in 306 (2.7 per cent) of the cases of normal delivery and in 343 (4 per cent) of those of operative delivery. In the cases of spontaneous delivery there was 1 death, a mortality of 0.1 per cent.

Of the cases of operative delivery, morbidity occurred in 343 (22.4 per cent) and death in 19 (1.24 per cent). There was the usual incidence of forceps delivery. Perforation was done only on dead fetuses. The incidence of version was decreased, but that of cesarean section was greatly increased in accordance with the broadened indications. In 194 cases in which cesarean section was done there were 8 deaths, a mortality of 3.4 per cent. Because of its unfavorable results, symphysectomy is no longer performed.

In the same period of time 168 women were admitted after delivery at their homes. Half of them had been delivered spontaneously and half

# GENITO-URINARY SURGERY

## ADRENAL, KIDNEY, AND URETER

Gottesman, J., Perla, D., and Elson, J. The Pathogenesis of Hypernephroma *Arch Surg*, 1932, **xxiv**, 722

It is commonly believed that hypernephroma is a highly malignant tumor and has a rapid course, but this concept is at variance with the authors' findings. The authors report a study of forty-four cases. In thirty-three the diagnosis was confirmed by autopsy, and in the remainder was based on the findings in removed kidneys or biopsies on metastases. In twenty-eight cases there were clinical manifestations of neoplasm. In sixteen the hypernephromata were discovered accidentally at autopsy. Such tumors were limited to a kidney or a suprarenal gland. The patients in this group presented no clinical evidence of hypernephroma and all of them died of an unrelated disease in which the tumor played no apparent rôle.

On histological examination the tumors show marked variations in the structure and arrangement of their cellular elements. Much of the confusion in the literature has arisen from attempts to limit the diagnosis of hypernephroma to tumors presenting a microscopic resemblance to the cortex of the suprarenals. Ewing excluded from this group tumors with distinct lumina and those showing papillary structures. By some, hypernephromata are believed to have their origin in rests of the suprarenal cortex, and by others they are believed to originate in cells of the kidney tubules.

Of the authors' twenty-eight cases with clinical manifestations of neoplasm, autopsy was performed in nineteen. In nine cases the pathological diagnosis was based on excised tissue. The age of onset varied from thirty-five to seventy years. The greatest number of the tumors occurred in the fifth and sixth decades. The duration of the illness ranged from six months to twenty-two years. The average duration of life after the onset of the initial symptoms was four years and four months. The onset was characterized most frequently by urinary manifestations such as frequency, tenesmus, nocturia, inability to void, and hæmaturia. In some cases the first complaint was abdominal or lumbar pain. In others no symptoms were noted until the mass was quite large. In a few cases loss of weight and weakness were the first symptoms. Frequently, metastatic lesions were the earliest evidence of the condition. In one case a pathological fracture due to metastasis was the first indication of malignancy. In another, the first symptoms were those of a brain tumor. In five cases they suggested a neoplasm primary in the pelvic bones. In one case the first evidence was a pulmonary metastasis, and in another vaginal bleeding.

In thirteen cases nephrectomy was performed, but all of the patients died. Roentgen therapy was of slight value, relieving the pain from metastases in the bones and lungs in only a few cases.

Of the sixteen cases in which the tumor was not diagnosed clinically, it arose in the renal parenchyma in fourteen and in the suprarenal gland in two. The patients ranged in age from twenty-three to seventy-nine years. None showed symptoms or signs of hypernephroma. The tumors resembled those with clinical manifestations. There were all gradations from benign suprarenal cortical adenomata in the kidney or suprarenal gland to highly malignant hypernephromata. Benign adenomatous tissue, malignant hypernephroma cells, alveolar structures, and papillary formations were found in different areas of the same neoplasm.

Highly malignant tumors may reach a considerable size without causing clinical manifestations. In one of the cases reviewed the findings suggested that the hypernephroma represented the malignant transformation of a benign tumor. If this interpretation was correct the life cycle of hypernephroma must be extremely long. The cortical rest of congenital origin in the kidney may at any time undergo adenomatous growth and develop into a more rapidly growing or malignant tumor. As there are probably periods of arrest of such growths, it is almost impossible to determine the age of hypernephromata.

The intimate relationship between the hypernephroma and its extensive vascular supply permits early metastatic dissemination by rupture into the thin-walled veins in the neoplasm. The metastases may occur at a stage of relatively low malignancy of the tumor.

LOUIS NEUWELT, M.D.

Kirsch. Neuroblastoma of the Medulla of the Suprarenal (Le neuroblastome de la medullo-surrenale) *Arch franco-belges de chir*, 1931-32, **xxxiii**, 121

Neuroblastomata of the medulla of the suprarenal are derived from undifferentiated cells of the sympathetic nervous system. As they could not arise from the few sympathetic cells in the normal suprarenal, they must have their origin in embryonic inclusions in the gland. Similar tumors are found in other chromaffin organs such as the parotid gland, Zuckerlandl's organ, and the coccygeal gland. The neoplasms are characterized microscopically by lymphocytoid cells, slender fibrils, and rosette-like structures.

The most frequent sites of metastasis are the liver, glands, and bones. Metastatic nodules are often formed on the skull. Under such conditions the head is enlarged, giving the impression of hydrocephalus, and the scalp is raised by nodules ranging

Borrás, P. E.: Chorionepithelioma and the Aschheim-Zondek Reaction (El corioepiteloma y la reacción de Aschheim-Zondek). *Rev. med. & Quím.* 932, xxi, 9.

Borrás states that after curettage in cases of hydatiform mole and chorionepithelioma the Aschheim-Zondek reaction is of particular value because a negative result indicates that the hyperplastic tissue has been entirely removed. If any of the chorionic villi remain, the reaction will continue to be positive. The amount of the hormone of the anterior lobe of the hypophysis which is present in the urine in hydatiform mole and chorionepithelioma is much greater than the amount present in normal pregnancy. This difference is of importance as it permits a diagnosis of degeneration of the chorionic villi, which means hydatiform mole or chorionepithelioma. The reason for the quantitative difference is not known. It is impossible to determine the time of the beginning of malignancy of a hydati-

form mole or of the implantation of a chorionepithelioma. According to various authorities, chorionepithelioma follows hydatiform mole in 41.5 per cent of the cases, abortion in 36.6 per cent, normal pregnancy and pregnancy terminated prematurely in 22.6 per cent, and tubal pregnancy in 2.3 per cent. In cases in which hydatiform mole is the cause, histological examination often does not indicate the malignant evolution of the villi of the mole, but the Aschheim Zondek test solves the problem although the reaction is identical for mole and chorionepithelioma.

The author reports a case in which a diagnosis of chorionepithelioma was made on the basis of a positive Aschheim-Zondek reaction and confirmed by the findings at operation, and a case in which chorionepithelioma was suspected but the Aschheim-Zondek test was negative and the symptoms later disappeared without surgical intervention.

A. E. TART, M.D.

pathological changes occurring in the kidney as the result of such infections

Material obtained at autopsy in clinical cases does not afford an opportunity to study the pathological changes restricted to the renal pelvis. However, Helmholtz has found such changes in rabbits suffering from spontaneous pyelitis.

A study of the lesions discovered in cases of pyelitis of extremely short duration would be the best method of obtaining information regarding the pathogenesis of the disease. There are very few reports in the literature regarding these changes. This is due to the fact that the condition is seldom fatal.

The author reports four cases in which histological studies were made. All were cases of infection of the urinary tract by colon bacilli without accompanying obstruction. In infections lasting only three days there was an acute, widespread suppurative process involving the renal and peripelvic tissues. In cases of from three days' to three weeks' duration there was definite pyelitis with involvement of the parenchyma, the formation of abscesses, and diffuse infiltration. These lesions showed a tendency to heal promptly. The conditions found in these cases emphasize the fact that little information concerning the mode of infection in pyelitis can be obtained from a study of pathological changes in material from human beings.

Hæmatogenous and ascending lesions with and without obstruction were produced experimentally and studied in detail. The hæmatogenous lesions were found to occur first in the cortex and medulla, and the ascending lesions in obstructed kidneys were found to occur first in the peripelvic tissue. In both types of infection the process spread rapidly throughout the kidney. Obstruction did not favor the localization in the kidney of organisms injected intravenously. The healing process begins early, as in the human being, and proceeds rapidly, with the ultimate formation of fibrous tissue.

The lesions in human beings that were studied resemble experimentally produced ascending lesions more closely than they resemble experimentally produced hæmatogenous lesions.

Migliardi, L. Intravenous Pyelography in Renal Tuberculosis (*La picrografia endovenosa nella tubercolosi renale*). *Radiol med*, 1932, xix, 451.

Migliardi reports the findings of intravenous pyelography in twenty-six cases of renal tuberculosis. From this study he concludes that it is more or less impossible to make a diagnosis of renal tuberculosis solely on the basis of the X-ray findings as the shadows associated with this disease are often similar to those found in other kidney conditions. However, the presence of a kidney cavity demonstrable by intravenous pyelography may be diagnostic of renal tuberculosis.

Intravenous pyelography should not be substituted for the usual clinical diagnostic procedures, but should be used to supplement them. Important

determinations in the pyelographic examination are the size and location of the renal shadows, the difference in opacity and appearance time of the pyeloureteral shadows, the shape of the pelvis, calyces, and cavities, and the size and direction of the ureters. Intravenous pyelography is of special importance in cases of so-called inoperable bladder in which retrograde catheterization of the ureters is impossible. In such cases intravenous pyelography associated with functional kidney tests gives sufficient information to establish the indications for surgical intervention.

PETER A. ROST, M.D.

Stuart, G., and Krikorian, K. S. The Occurrence of True Bone With a Renal Calculus. *J. Path. & Bacteriol*, 1932, xxxv, 373.

It is generally recognized that in the human body the presence of bone may often be demonstrated elsewhere than in the skeleton. However, bone formation in the pedicle attachment of a renal calculus to the kidney pelvis has been only once recorded. In 1923 Phemister reported the discovery of such bone formation in two cases in which nephrectomy was performed.

The renal calculus in which the authors discovered bone formation was found in a case of multiple renal calculi associated with pyonephrosis. Chemical analysis showed it to consist mainly of calcium oxalate and calcium phosphate. Histological examination disclosed compact and cancellated osseous tissue and a perosteum-like membrane adjacent to the compact portion. On higher magnification the cancellated bone showed numerous capillaries and spaces for fat and marrow cells. The calculus had been present in the kidney for at least six years.

JACOB S. GROVE, M.D.

Papin, E. A Study of the Surgery of Renal Lithiasis, with Particular Reference to Conservative Methods (*Etude sur la chirurgie de la lithiase rénale et en particulier sur les méthodes conservatrices*). *Arch. d. mal. d. reins et d. organes génito-urinaires*, 1932, vi, 493.

The author reports a study of 136 cases of renal calculi, 129 of which were treated surgically. He draws the following conclusions:

1. In cases of renal lithiasis radical operations are much more serious than conservative operations.
2. Pyelotomy is almost free from mortality.
3. In contrast to the classical type of nephrotomy, nephrotomy limited to the indications found by X-ray studies is equally without risk.
4. A conservative operation should not be chosen when recurrence is almost certain. The low incidence of recurrence in cases reviewed was probably due to the fact that a radical operation was done in half of the cases.
5. Major advances in the surgery of renal lithiasis have been due to the X-ray, improved surgical methods of suture and drainage, and improvement in the technique of nephropexy.

FRANK M. COCHEMS, M.D.

in case from that of a pea to that of a nut, which are scattered over the surface of the skull. Exophthalmos may be caused by nodules on the walls of the orbits.

The tumors usually occur in children under three years of age. The oldest patient whose case has been reported was ten years of age. The disease begins gradually. It has no pathognomonic symptoms. The general health is poor. The child loses weight and becomes cachectic in appearance. The picture is that of a severe acute anemia with little plastic reaction. Splenomegaly and adenoopathy are absent. The leucocyte count is not high. The formula does not indicate either myeloid or lymphatic leukemia. The disease may be mistaken for syphilis or tuberculosis. The only means by which a positive diagnosis can be made is biopsy on the skull nodules.

The course of the tumors is *curv exipid* the younger the patient and the more undifferentiated the stage of the sympathetic cells from which the neoplasm is derived. The maximum length of life after the beginning of the tumor is a year. As a rule the patient survives only a few months. Only one case of survival after an operation is reported in the literature and the late results in this case are unknown. The author suggests that something might be accomplished in the treatment of the condition by roentgen or radium irradiation.

ALBERT LONE MONAGH, M.D.

Mark, E. G., and Johnson, R. T.: The Osmotic Effects of Various Pyloric Media upon the Mucosa. An Experimental Study. *J. Col.* 31: 377, 1935.

The experiments reported by the authors, which were carried out on 40 dogs, show that the trauma found following pyloroplasty is due to the pyloric media used and not to overdistention. The pyloric media studied included 40 and 50 per cent solutions of crosclectan, 50 and 15 per cent solutions of loper, a 50 per cent solution of sodium bromide, a 15 per cent solution of sodium bromide, and a 15 per cent solution of sodium iodide. In the cases of six dogs used as controls normal saline solution was employed. Because of its resistance to infection, the injections were made into the bladder.

In the first sixteen experiments the bladder was catheterized under ether anesthesia, but as the anesthesia rendered it difficult to determine when the bladder was empty the catheterization in the rest of the experiments was done without the use of an anesthetic. After the bladder had been emptied, from 50 to 90 c.c.m. of the medium were slowly injected. Twenty-four hours later the dog was sacrificed and the bladder studied.

The dogs receiving injections of sodium bromide, crosclectan, and loper showed no more trauma than the control dogs. In those receiving injections of sodium iodide, congestion of the mucosal vessels and edema were found, but there was no hemorrhage or ulceration.

The use of sodium bromide caused marked injury to the mucosa ranging from focal hemorrhage and ulceration to a diffuse hemorrhagic inflammatory exudate with focal necrosis. The authors draw the following conclusions:

1. A 15 per cent solution of sodium bromide is dangerous as a trophic agent.

2. A 15 per cent solution of sodium iodide produces orders of the mucosa and irritates.

3. Although a 50 per cent solution of loper produces approximately the same degree of necrosis as a 15 per cent solution of sodium iodide, it causes no mucosal or submucosal changes and no irritation.

4. A 50 per cent solution of sodium causes no mucosal or irritation.

5. Sodium and loper may be used for histological pyelograms.

6. While overdistention causes pain and damage, the chief factor in mucosal trauma is the character of the drug. CLAUDE D. FROST, M.D.

Albert, Y.: Hematuria from a Nephritic Kidney. Decompression; Cure (Lactaria is non-uricemic decompression; gastritis). *Ch. Ch.* 1935, vii, 182.

The case reported was that of a woman twenty-four years of age who had previously been with N. evidence of pyelitis was found in the patient or her husband. The patient had borne five healthy children. After her fifth delivery she suffered intense pain in the right flank. About three months later she had evening fever for about two weeks and for one day during this period she passed bright red and clotted blood with the urine.

Examination revealed no evidence of stones, tuberculosis, or tumor and functional tests showed no insufficiency of the kidney.

At operation the kidney was found to be small and divided into lobules by sulci which gave it about the appearance of an embryonic kidney. Along the sulci the kidney tissue was sclerotic and the capsule was thickened and firmly adherent. It seemed apparent that during the fifth pregnancy there had been a partial infarction of the kidney at these sites which left the capsule thickened and adherent and the parenchyma sclerotic. The pain and hematuria were evidently produced by compression and traction on the blood vessels and the nerves at these sites. Decompression was followed by complete recovery. In cases in which improvement can be brought about by mechanical decompression and improvement of the blood supply this operation is preferable to dissection.

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FRANK M. COCHEM, M.D.



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ARTHUR GOSWAMI, M.D.

Mark, E. G., and Johnson, E. T.: The Immediate Effects of Various Pyroelectric Media upon the Mucosa. An Experimental Study. *J. Urol.* 193 1934, 951

The experiments reported by the authors, which were carried out on 40 dogs, show that the trauma found following pyrography is due to the pyroelectric medium used and not to overdistention. The pyroelectric media studied included 40 and 50 per cent solutions of uroselectan, 50 and 75 per cent solutions of loper, a 70 per cent solution of skiodan, a 25 per cent solution of sodium bromide, and a 15.5 per cent solution of sodium iodide. In the cases of six dogs used as controls normal saline solution was employed. Because of its resistance to infection, the injections were made into the bladder.

In the first sixteen experiments the bladder was catheterized under ether anesthesia, but as the anesthesia rendered it difficult to determine when the bladder was empty the catheterization in the rest of the experiments was done without the use of an anesthetic. After the bladder had been emptied, from 50 to 60 ccm. of the medium were slowly injected. Twenty-four hours later the dog was sacrificed and the bladder studied.

The dogs receiving injections of skiodan, uroselectan, and loper showed no more trauma than the control dogs. In those receiving injections of sodium iodide, congestion of the mucosal vessels and edema were found, but there was no intense

stasis or ulceration. The use of sodium bromide caused marked injury to the mucosa ranging from focal hemorrhage and ulceration to a diffuse hemorrhagic inflammatory exudate with focal necrosis. The authors draw the following conclusions:

1. A 25 per cent solution of sodium bromide is dangerous as a urographic agent.
2. A 15.5 per cent solution of sodium iodide produces edema of the mucosa and irritation.
3. Although a 50 per cent solution of loper produces approximately the same degree of hemolysis as a 15.5 per cent solution of sodium iodide, it causes no mucosal or submucosal changes and no irritation.
4. A 50 per cent solution of skiodan causes no hemolysis or irritation.
5. Skiodan and loper may be used for bilateral pyelograms.
6. While overdistention causes pain and damage, the chief factor in mucosal trauma is the character of the drug.

CLAUDE D. FERRILL, M.D.

Albert, V.: Hematuria from a Nephrotic Kidney; Decapsulation; Cure (Embolus in the ascending aorta; decapsulation paragon). *Chir. 44* 932 34, 35

The case reported was that of a woman twenty-four years of age who had previously been sick. No evidence of syphilis was found in the patient or her husband. The patient had borne five healthy children. After her fifth delivery she suffered intense pain in the right flank. About three months later she had evening fever for about two weeks and for one day during this period she passed bright red and clotting blood with the urine.

Examination revealed no evidence of stone, tuberculosis, or tumor and functional tests showed no inefficiency of the kidney.

At operation the kidney was found to be small and divided into lobes by solid which gave it about the appearance of an embryonic kidney. Along the solid the kidney tissue was sclerotic and the capsule was thickened and firmly adherent. It seemed apparent that during the fifth pregnancy there had been a partial interstitial nephritis at those sites which left the capsule thickened and adherent and the paracapsular sclerotic. The pain and hematuria were evidently produced by compression and traction on the blood vessels and the nerves at these sites. Decapsulation was followed by complete recovery. In cases in which improvement can be brought about by mechanical decompression and improvement of the blood supply this operation is preferable to decapsulation.

ARTHUR GOSWAMI, M.D.

Kennedy R. L.: The Pathological Changes in Pyelitis of Children Interpreted on the Basis of Experimental Lesions. *J. Urol.* 934 1934, 37

Urinary tract infections in children are usually due to the colon bacillus. Kennedy discusses the

selves or may be removed by slight traction after about two weeks. The æsthetic result is very satisfactory. The prepuce may be removed if this is desired, but its removal is not necessary.

The author has performed the operation on forty patients from two to twenty-six years of age. He has never known the flap to become gangrenous.

The steps in the operation are shown in illustrations.

AUDREY GOSS MORGAN, M.D.

### GENITAL ORGANS

Muschat, M. The Pathological Anatomy of Testicular Torsion, An Explanation of Its Mechanism. *Surg, Gynec & Obst*, 1932, lvi, 758.

Torsion of the spermatic cord constricts the blood vessels and if not corrected immediately leads to gangrene of the testicle and its adnexa. It may be intravaginal or extravaginal. In the majority of reported cases of extravaginal torsion the condition was a complication of undescended testis. The author therefore believes it was due to pressure rather than torsion. According to Young, extravaginal torsion results from a severe external force which tears the undescended testicle from its scrotal attachment.

In the normal scrotum the strong attachment between the testicle and the epididymis and the attachment of the epididymis to the inner wall of the scrotum render it almost impossible to rotate the testicle after the vaginal sac is opened.

In the normal scrotum the posterior aspect of the epididymis is outside of the vaginal sac and becomes attached to the inner wall of the scrotum. In cases of torsion, the vaginal sac completely surrounds the testicle and epididymis and part of the spermatic cord above the testicle. The abnormalities outlined by Meltzer may be explained by early high investment of the testicle, epididymis, and cord.

To determine the force which causes torsion, the author studied serial sections made from tissue obtained eighteen hours after the onset of torsion. These sections were mounted and placed under a drawing microscope. The connective tissue was stained blue and the muscle red. The drawings were transferred to glass plates and the plates placed on top of each other so that the spermatic cord with its twist was reconstructed. The topography of the cremasteric muscle was transferred to a rubber cord which was twisted in the same way as the spermatic cord. When the rubber cord was untwisted the cremaster appeared in the form of a broad band-like spiral.

The relative topography of the cremaster is changed because of the high investment of the spermatic cord. Fibers are carried into the vaginal sac to the lower end of the spermatic cord. A strong contraction of the muscle will rotate the testicle, epididymis, and cord.

The author believes that the main factor in torsion is high investment of the testicle, epididymis, and cord, which permits the cremaster muscle to be carried into the sac. CLAUDE D. PICKRELL, M.D.

Hepler, A. B. The Surgery of the Undescended Testes. A Modified Torek Operation. *West J Surg, Obst & Gynec*, 1932, xl, 286.

The recent work of Moore and of Wangenstein has revived interest in the undescended testicle. In a series of experiments carried out by Wangenstein on adult dogs one testicle was placed in the abdomen and the dogs were sacrificed after periods ranging from a few days to several months. It was found that within a few days a marked degeneration of the germinal epithelium occurred. After a few months the seminiferous tubules were lined by a single layer of Sertoli cells.

In another series of experiments on adult dogs carried out by Wangenstein both testicles were transplanted and after varying intervals of time one testicle was removed for examination and the other replaced in the scrotum. If the testicle was replaced within four weeks, regeneration of the germinal epithelium occurred. After three months the power to regenerate was lost. The regeneration was less complete if the testicle retracted to the lower end of the inguinal canal. When the same procedure was carried out on pups there was no difference in the transplanted testicle and the control. Therefore in the prepuberty testicle an abnormal position caused no changes.

Moore demonstrated that the testicle is thermosensitive as well as radiosensitive. Exposure of the dog's scrotum for two hours to 45 degrees of heat produced degenerative changes. In a ram, aspermia was caused by covering the scrotum with a heavy woolen cover.

Between the temperature of the abdomen and the temperature of the scrotum there is a difference of from 3 to 4 degrees C. The scrotum is a heat-regulating organ.

The findings of the investigations cited show that the prepuberty undescended testicle is potentially a good testicle. Spermatogenesis will follow if it is properly placed in its correct position. Orchidopexy is best performed between the ages of six and ten years.

The adult undescended testicle is aspermatic because of the constantly higher temperature to which it is exposed.

For successful results from orchidopexy the cord must be of sufficient length for the testicle to be placed in the bottom of the scrotum without tension, the blood supply must be preserved, and the testicle must be kept in place.

The usual operation is that of Bevan. In this procedure the processus vaginalis and fascial coverings of the cord are removed, the vas and vessels are separated, and a pursestring suture is placed at the neck of the scrotum to prevent the testicle from retracting.

The work of Fecher showed that retraction is due to the elasticity of the vas. The pursestring suture used in the Bevan operation prevents retraction into the inguinal canal, but it anchors the testicle in an unfavorable position.

Hanner, G. L.: So-Called Essential Hematurias. Are They Chiefly Due to Urethral Stricture? *Am. J. Surg.* 1931 xvi, 219.

From an analysis of 200 cases of hematuria the author concludes that the most frequent cause of renal bleeding is urethral stricture, and that this condition with frequently associated focal infection accounts for practically all of the cases in which formerly a diagnosis of idiopathic or essential hematuria was made. He believes that the bleeding is brought about by an increase in the intrarenal pressure. Intermittent hematuria may be explained by intermittent urethral strictures, the acute attack being produced by an acute infection or a surgical operation.

In the 200 cases of hematuria investigated the author found 174 strictures of the ureter. In 23 cases the ureters were not examined because the hematuria was obviously of bladder origin or the examination was refused.

The author states that in 66 2/3 per cent he obtained ideal results with no other treatment than urethral dilatation. He therefore questions whether the terms "idiopathic and essential" as applied to hematuria are of practical value. He believes they tend to favor inaccurate observations and incorrect treatment. He emphasizes that the finding of urethral stricture in association with renal bleeding does not remove the diagnostician from the responsibility of further study to determine whether the stricture and distant focal infection are the only factors responsible for the hematuria.

In the discussion of this report, LOWERY called attention to the so-called trophic bladder in women which is relieved by glandular therapy.

RATNAUM stated that Hanner's work limits the diagnosis of idiopathic hematuria to fewer than 5 per cent of the cases in which it was made formerly.

STEVENS agreed with Hanner that irrigation of the renal pelvis should not be done in stricture cases.

DOUGLAS E. HENNE, M.D.

#### BLADDER, URETHRA, AND PENIS

Le Castra, R. M.: Neoplasms Primary In Bladder Diverticula. *J. Urol.* 1931 xvii, 667.

In the literature the author has found the reports of forty-one primary neoplasms in diverticula of the bladder. He reports a case of his own and reviews the cases recorded by others. The ages of the patients ranged from forty-eight to seventy-six years. In about 77 per cent of the cases, hematuria was an outstanding feature. The diagnosis was made at operation in twenty-one cases and by cystoscopic examination in ten. Of fourteen cases in which cystograms were made, a filling defect was observed in six. The diagnosis is not difficult if the tumor protrudes from the diverticular orifice, if the cystoscope can be introduced into the sac, or if the tumor can be seen. The presence of a tumor may be suspected when blood is observed to come from a diverticular opening.

In thirty-one of the cases reviewed operation was done. In twenty-five it consisted of excision, in three of drainage, in two of fulguration and in one, of radium implantation. Thirteen of the patients treated by excision were reported cured, but the longest period of observation was only seventeen months. The others died. The longest period of survival in the fatal cases was twenty-nine months. Death resulted in all cases treated by drainage and by radium irradiation.

The author's patient was a man fifty-two years of age who gave a history of hematuria. Cystoscopic examination revealed a tumor protruding from a diverticular orifice. The diverticulum and tumor were excised. On cystoscopic examination six months later the bladder was found normal. Pathological examination showed the tumor to be a papillary carcinoma of Grade 1 according to Baader's grading of malignancy. MARVIN ALTMAN, M.D.

Mathison, P.: Treatment of Balanitis or Posthitis by Hypospadias. (Traitement en un temps de l'hypospadias balanitis ou posthitis). *J. de chir.* 1931, xxvii, 41.

The operation described is performed under general anesthesia. With the penis turned back on the abdomen and held by forceps, a flap with a broad base is traced a little back of the hypospadias opening. The base is made broad enough to insure a good blood supply. As the flap is very elastic, its length need be only a little more than the space which separates the hypospadias opening from the end of the glans. The flap is made thick enough to include all of the cellular tissue which surrounds the corpora cavernosa and spongiosum at this level. The incision is continued around the end of the hypospadias opening. The slight hemorrhage caused by the incision is easily controlled by compression. The incision around the mouth of the opening need be only deep enough for the fine suture needles to pass through the edges easily.

The flap is dissected free and turned back over the hypospadias opening. Its sides edges are then sutured to the bleeding edges of the lateral lip of the incision around the opening with fine interrupted silk sutures. The sutures for the two sides are of different colors and are brought out through the new opening. As the sutures are continued toward the tip the flap is stretched a little to yield a small skin flap which can be turned back a few millimeters on the bleeding surface of the flap to form the new urethral meatus. The two last sutures must be exactly symmetrical to give the new meatus a normal shape. The edges of the turned-back flap are fixed by a few sutures to the external lip of the incision around the opening and to the roots of the prepuce. The skin of the penis is then brought together in the midline and the two flaps are sutured together with fine horsehair.

Recovery is as rapid and smooth as after circumcision. The horsehair sutures are removed at the end of a week, and the silk sutures come out of them-

# SURGERY OF THE BONES, JOINTS, MUSCLES, TENDONS

## CONDITIONS OF THE BONES, JOINTS, MUSCLES, TENDONS, ETC

Maxwell, J. P., Hu, C. H., and Turnbull, H. M.  
Fetal Rickets *J. Path. & Bacteriol.*, 1932, xxxv,  
419

The authors report the case of rickets in a child who died sixty-five hours after birth. The mother, a Chinese woman, had a typical osteomalacic pelvis. The child was delivered by cesarean section. At birth it presented overlapping of the cranial sutures, a marked rachitic rosary, and Harrison's grooves.

There was a disturbance of endochondral ossification with incomplete and focal provisional calcification and irregular and incomplete invasion of cartilage cells by vessels and osteogenic tissue characteristic of fetal rickets.

These disturbances of endochondral ossification are found also in congenital syphilis and Barlow's disease (infantile scurvy). However, in Barlow's disease the occurrence of provisional calcification in all vascularized portions of the cartilage and the excessive accumulation of such calcification effect a difference in the disturbance of endochondral ossification. In congenital syphilis calcification ceases in parts of the cartilage, but continues at other levels together with endochondral ossification, and there is a necrosis of the cartilage cells caused by toxins of the spirochætes.

The authors conclude that fetal rickets cannot be differentiated from osteomalacia.

RUDOLPH S. REICH, M.D.

Williams, H. W. Multiple Myeloma of Bone. A Report of Two Cases, With Remarks on the Histogenesis. *Am. J. Cancer*, 1932, xvi, 540.

Seeking support for his theory that multiple myelomata are derived from cells in bone marrow which are normally concerned with bone resorption, the author made histological studies in two cases of multiple myeloma coming to autopsy.

The first case was that of a man fifty-six years of age whose symptoms consisted chiefly of pain radiating from the back around both sides to the front of the chest. The body of the sixth thoracic vertebra showed compression with kyphosis of the spine at this level. Later roentgenograms disclosed round, punched-out areas in the skull, pelvis, and leg bones. At autopsy these areas were found to be soft grayish-white tissue which completely replaced the bone. The body of the sixth thoracic vertebra was easily sectioned with a knife. The cut surface was red. All of the other vertebrae were soft. The femoral bone marrow was devoid of fat. Scattered through it were islands of grayish-white tissue.

On microscopic examination these areas were found to be composed of oval cells with a round, eccentrically placed nucleus and a prominent nucleolus. The chromatin had a vesicular character due to fine threads. There were no definite boundaries to the tumors. Myelocytes were not numerous. In the rib tumors, cells identical with those in the femur were found. In the collapsed vertebra the general picture was that of repair tissue, but typical tumor cells were found near the vertebral disks. Tumor nodules in the other vertebrae also showed the cells described. There was no evidence of osteoclastic resorption, the bone cells looked viable.

The second case was that of a man forty-seven years of age who complained of pain in the neck. Death followed the development of pneumonia. At autopsy the second cervical vertebra was found completely replaced by soft, grayish-pink tissue without invasion of the cord or other surrounding tissues. The tumor tissue contained oval cells with round eccentric nuclei like those in the first case.

According to an early theory, myelomata are derived from the plasma cell, as the cells found in the tumors resemble the plasma cell. Because of the multiple origin of the lesions, however, this histogenesis would require the presence of plasma cells in all bone marrow, a condition which is not generally believed to occur. Moreover, the plasma cell does not possess the property of resorbing bone which is credited to the tumor cells.

The theory that myelomata are of myelocytic origin is based on morphological characteristics alone.

The diffuse and extensive bone destruction present in cases of myeloma suggests that the myeloma cell is the most potent bone destroyer of all cells found in all bone tumors or tumors forming bone metastases. The cells are almost identical in morphology with osteoblasts. The latter are always present in old bone marrow and are fixed cells. However, the function of the osteoblast is still uncertain. According to some, this cell is capable of bone destruction as well as bone formation.

The author concludes that while it has not been proved that the osteoblast is the cell of origin, there is as much evidence in support of this theory as for the theory that the plasma cell or myelocytic cell is the primary cell. WILLIAM ARTHUR CLARK, M.D.

Sæur, R. Osseous Endothelioma or Ewing's Sarcoma (L'endothéliome osseux ou sarcome d'Ewing). *Revue d'orthop.*, 1932, xxxix, 197.

Among the bone sarcomata, round-cell and polyhedral-cell forms have been recognized for a long time. In 1921 Ewing called attention to a definite type of round-cell sarcoma of bone with not only a

The operation described by Torek in 1909 has been used by the author with slight modifications, with very good results. To guard against retraction, the testicle is brought out through an opening in the lower end of the scrotum and sutured to the fascia on the inner side of the thigh. Hepler uses the severed gubernaculum instead of the tunica albuginea to fix the testicle. Unnecessary trauma is avoided. The testicle is released after three or four months. If the condition is bilateral, the operation is then performed on the other side. The technique is described in detail.

During the past year the author has performed this operation in twelve cases with satisfactory results.

CLAUDE D. PICKRELL, M.D.

#### MISCELLANEOUS

Clementi, M. Eosinophilia in States of Retention of Urine (*Eosinofilia negli stati di ritenzione d'urina*). *Arch. Ital. di urol.* 1931 VIII, 45

Clementi briefly reviews the conditions causing an increase in the eosinophilic leucocytes in the blood and reports clinical and experimental observations concerning the eosinophilia associated with states of urinary retention.

The eosinophilia associated with adenoma of the prostate is more marked the greater the urinary retention. Simple decompression of the bladder reduces it. If the adenoma of the prostate is not removed the eosinophilia persists, presumably as a reaction to the toxic products excreted by the tumor.

Eosinophilia is associated also with urinary retention from causes other than prostatic. In dogs an eosinophilic leucocytosis may develop after the production of an experimental hydronephrosis. In these animals there is probably resorption of the stagnant urine due to an alteration of the kidney parenchyma and pelvo-ureteral walls. The eosinophilia is most marked from thirty to sixty days after ligation of one ureter, a time when the resorption of urine is at the maximum and uremia is slowly supervening.

In the septic hypernephroses hyper eosinophilia fails to occur either because of a negative chemotaxis of the bacterial toxins or failure of absorption. In the presence of infection the kidneys are in a phase of degeneration and sclerosis which materially hinders absorption of the stagnant urine. Therefore a septic toxemia rather than a true uremia results.

PETER A. ROSE, M.D.

Giuliani, G. Connective Tissue and Endochondral Ossification Produced Experimentally (Ossificazione connettivale ed ossificazione encondrale ottenute sperimentalmente) *Arch ital di chir*, 1932, xxxi, 268

The author carried out experiments on rabbits to determine the difference in new bone formation in the kidney when the artery or vein is ligated.

Up to the fifth day in both groups of animals tricalcium phosphate (the principal constituent of bone) was formed, whereas in the normal kidney there is monocalcium and bicalcium phosphate. Quantitative analysis of kidneys in which the vein was ligated revealed a direct relationship between the progressive increase of the calcium, up to saturation, and the duration of the experiment. The calcium increased far more than the phosphoric acid, and the excess of calcium formed combinations with other acids, notably carbonic acid, with which it formed calcium carbonate.

From the histological point of view, ligation of the vein produces connective tissue bone, whereas ligation of the artery produces a type of endochondral ossification. Under the former conditions there is stasis, and under the latter ischæmia. In the first, the ossification takes place in a vast venous plexus, whereas in the second the development of the long bones is accompanied by a relative ischæmia.

Enchondroses of the fingers and femur and exostoses of the mandible, cranium, and periosteum may be shown histologically to represent ossification of either the endochondral or the connective tissue type. The former requires ischæmia and the latter stasis, two conditions which may be of etiological importance.

A. Louis Rost, M.D.

Davis, J. S., and Finesilver, E. M. Dupuytren's Contraction, with a Note on the Incidence of the Contraction in Diabetes. *Arch Surg*, 1932, xlii, 933

This report is based on a review of the literature, forty cases of Dupuytren's contraction heretofore unreported, and six cases found among 200 diabetic patients.

The condition is a permanent flexion of one or more fingers due to contraction of the palmar aponeurosis and its digital prolongations. It is a focal hypertrophy of the connective tissue originating in the walls of the smallest vessels.

The authors review the surgical and microscopic anatomy and describe the function of the palmar aponeurosis.

Of the four main theories as to the cause of Dupuytren's contraction, one attributes the condition to external influences such as repeated trauma to the palm, another, to constitutional factors and heredity, the third, to constitutional predisposition plus trauma, and the fourth, to miscellaneous factors.

Of the authors' patients, nine believed that the contraction was due to trauma, but this was difficult to prove. A traumatic origin seems to be ruled out by the following facts:

1 The usual age of onset is after middle life, many years later than the beginning of the period of active labor.

2 The involvement is often bilateral.

3 The contraction is not limited to persons doing manual labor.

4 The left hand is affected about as frequently as the right hand, and the ring and little fingers are much more frequently affected than the radial half of the hand which bears the brunt of manual labor to an equal, if not a greater, degree.

5 The condition is much less common than trauma to the hand.

The theory that the contraction is a manifestation of a constitutional condition such as gout or rheumatism has been widely accepted. However, in the authors' cases the incidence of gout or rheumatism was only 10 per cent.

Some believe that there is a marked agreement between arthritis deformans and Dupuytren's contraction as both conditions frequently begin in youth, may remain latent for a long period, and during a long life may not progress far enough to cause pronounced deformity of the joints or marked contraction of the fingers. Of the authors' cases, arthritis deformans was present in only one.

A review of the literature seems to indicate that in certain families there is a predisposition to Dupuytren's contraction. In a study of one such family Sprogis traced the condition through three generations, finding it in seventeen of fifty-three persons. Only two of the subjects were women. Of the authors' patients, five gave a family history of the condition.

The authors quote Schubert as stating that a direct connection between injury affecting the palm and the development of true Dupuytren's contraction has not yet been definitely proved. In expert testimony concerning accidents, a direct relation should usually be rejected. However, in predisposed persons, an injury may cause the full development of a clinically symptomless Dupuytren contraction.

Schubert is of the opinion that the constitutional tendency toward Dupuytren's contraction may be congenital. The authors believe that congenital contractions of the fingers are in no way related to Dupuytren's contraction. In support of their opinion they cite the following facts:

1 While the former are congenital, the latter generally occurs during adult life.

2 Congenital contractions usually develop in females, whereas Dupuytren's contraction is most common in males.

3 In congenital contractions the central portion of the palmar fascia and its lateral prolongations are never involved. Therefore the first phalanx is hyperextended rather than flexed.

4 In congenital contractions the skin is atrophied, but is seldom indurated and lumpy as in Dupuytren's contraction.

The authors conclude with Nichols that Dupuytren's contraction is of idiopathic origin, that it is

definite histological structure, but also characteristic clinical symptoms, roentgen-ray appearance, and radiosensitivity.

In various series of cases of bone tumors studied the incidence of this tumor ranged from 6 to 22 per cent. The neoplasm is most frequent between the tenth and fourteenth years of age.

The onset is usually insidious and may be preceded by trauma. The early symptoms are deep pain indefinitely localized, slight swelling, and redness and warmth of the surface. At this stage the condition is often mistaken for acute osteomyelitis, but the roentgenograms are negative and the leucocyte count is low. If operation is performed the bone tissue is found to be soft and granular. In the presence of this picture the surgeon should not fail to have the tissues examined microscopically at once. Metastases are formed slowly in other bones, the lungs, or elsewhere. The base of the skull and the vertebrae are frequent sites for metastases.

During the first six months the roentgenogram will probably show nothing. The characteristic picture is that of irregular, diffuse absorption of the bone and fusiform enlargement of the shaft. The condition is easily differentiated from osteogenic sarcoma, but is not so easily differentiated from osteomyelitis. The terminal picture is that of massive destruction of the bone.

On macroscopic examination the growth is found to be diffuse, occupying first the entire medullary canal and later eroding the cortex and perforating into the soft tissues. On low magnification the cells appear round. They lie in layers and have deeply stained nuclei. On high magnification the nuclei appear round or oval. Mitoses is found to be moderate and the cell walls indefinite. The cells surrounding the capillaries may form rosettes or alveoli. Unlike osteogenic sarcoma, there are no giant cells, large nuclei, or bone formations.

According to Ewing the cells originate from the perilymphatic and perivascular endothelium. This accounts for the diffuse character throughout the marrow. The occurrence of reticular, diffuse, and vascular subtypes has been suggested, but the same tumor may present all of these structural types, depending upon where the section is cut.

In the diagnosis the tumor is easily differentiated from giant-cell tumor, myeloma, and metastatic growth. Syphilis may be ruled out by serological tests, and tuberculosis by the history. The neoplasm may be distinguished from the osteogenic sarcoma by its diffuse character, diaphyseal location, and radiosensitivity, and from chronic osteomyelitis by the absence of bacteria, the presence of characteristic cells in biopsy specimens, and the absence of sequestra and metastases.

In one series of cases on record a five-year cure was obtained in 18 per cent, and in another series, in 15.3 per cent.

It is generally agreed that the most effective treatment for Ewing's tumor is deep radiotherapy, but this must be given in sufficient doses and must

be repeated at the least sign of recurrence. Metastases must not be overlooked. Prophylactic irradiation should be given to the lungs. Curettage must be strictly avoided.

The author reports three cases of Ewing's tumor. The first was that of a girl five years old who had pain in the heel which caused limping. Six months after the onset of the symptoms the roentgenogram showed rarefaction in the os calcis. Radical treatment was given. Metastases occurred to the humerus. Two years after the onset of the condition considerable improvement was noted, but death resulted two years later from metastases. It is thought that the initial radium treatment (17,000 mc-hr in six weeks) was insufficient.

The second case was that of an eight-year-old boy who had a swelling of the forearm following a fall. Operation revealed a soft elastic tumor of the ulna and roentgen examination disclosed diffuse thickening. The diagnosis was confirmed at autopsy a year later. The treatment was inadequate.

The third case was that of a boy nine years old who developed acute pain in the heel following a fall. Roentgen examination showed absorption of the os calcis. Curettage and drainage were followed by healing of the wound, but as roentgen examination a year later showed persistence of the lesion in the bone, radiotherapy was given. Metastases occurred to the neck of the femur, the skull, and the lungs. Autopsy disclosed involvement of both femurs and humeri, one tibia, the vertebrae, and the lungs. The treatment in this case also was considered inadequate.

WILLIAM ARTHUR CLARK, M.D.

Dregstedt, C. A., and Keeton, J. E., *J. Exp. Med.* 1934. Experimental Study of Bone Repair: The Effect of Thyroparathyroidectomy and of the Administration of Parathormone. *Arch. Surg.* 1934, 79: 893.

An experimental study on 110 femora of dogs showed the rate of repair of a 4- to 5-cm. defect of the anterior surface to be reasonably constant during health but somewhat retarded by sickness. After thyroparathyroidectomy healing was definitely delayed, but was retarded less and went on to completion if calcium was administered to maintain the blood-calcium level at nearly normal. The parathyroid hormone did not seem to be necessary. In the cases of several dogs the administration of parathormone was followed by the very early deposit of calcium in the callus, but the time of complete healing was not changed. When the parathormone was given in reasonably large amounts, impairment of healing was observed, but as the dogs so treated frequently had bloody diarrhea and loss of appetite the interpretation of the results was complicated. Parathormone will probably not facilitate bone repair except in cases in which there is parathyroid deficiency. Thyroid deficiency uncomplicated by parathyroid deficiency did not delay the healing of a bone defect.

WILLIAM P. BLOUNT, M.D.

were less satisfactory than in the out-patients. Of forty-seven in-patients who were treated by open operation, good results were obtained in thirty-three, and of forty-one treated by closed reduction, good results were obtained in twenty-five. Of the fifty-nine out-patients, good results were obtained in fifty.

In the in-patient cases, the best results were obtained in fracture of the olecranon, internal epicondyle, supracondylar, and capitellum, in the order named.

Of the out-patient cases, good results were obtained in 85 per cent of those of supracondylar lesions, 66 per cent of those of lesions of the internal epicondyle, 75 per cent of those of lesions of the head of the radius, and 100 per cent of the others.

WILLIAM ARTHUR CLARK, M.D.

Massabuau and Guibal Progressive Correction of Vicious Deformity in the Volkmann Syndrome (Le redressement progressif intégral de l'attitude vicieuse dans le syndrome de Volkmann) *Revue d'orthop*, 1932, XXXIX, 239

The authors have perfected an adjustable splint which is a modification of the splints of Mommensen and Michel for gradual correction of the contractures of the fingers following Volkmann's ischæmic paralysis. While the original splints consisted of stiff wires embedded in a plaster cast on the forearm and extending in wide circles on each side of the hand, the author's splint is made of steel and leather, extends above the elbow, and has large wire rings

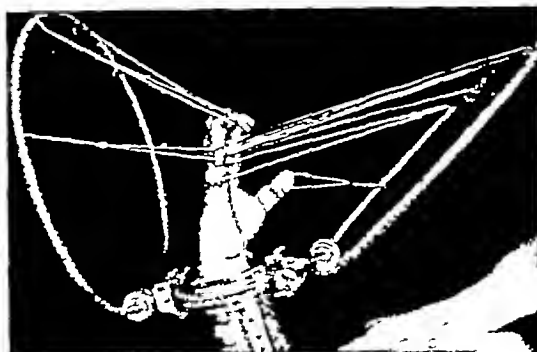


Fig 2 Individual straightening of the five fingers at one time which is rendered possible by the preliminary action of the roll

easily adjustable at the hand which permit its use on more than one patient.

One ring is on the palmar side and the other on the dorsal side. Extension of the fingers is obtained by means of non-elastic cords from the finger tips to the dorsal ring, and counter-extension by cords from the knuckles and wrist to the palmar ring. The rings may be moved independently to obtain different angles and distance from the hand and different directions of rotating force for the correction of pronation contracture. The latter is made possible by a sort of ratchet mechanism at the wrist.

The splint can be adjusted to all positions of the fingers, wrist, and forearm. Non-elastic cords have been found better than elastic cords. The finger attachments are made by means of aluminum bands curved to fit the finger, and the distal ends of the extension cords are hooked into small holes in the wire ring.

WILLIAM ARTHUR CLARK, M.D.

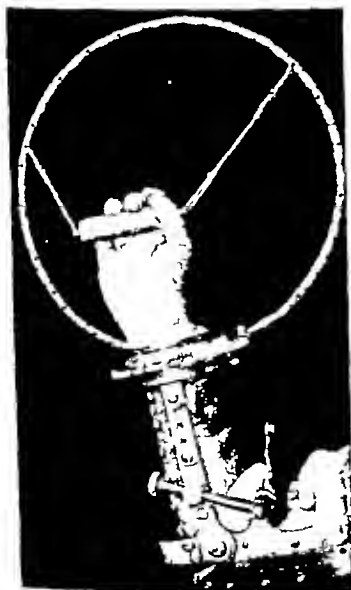


Fig 1 Simultaneous preliminary straightening of the four last fingers

Lexer, E. Substitution of the Flexor Tendons of the Fingers (Ersatz der Fingerbeugesehnen) *Deutsche Ztschr f Chir*, 1931, CCXXXI, 688

The author first calls attention to the difficulties which hinder the return of function following substitution of the flexor tendons of the fingers. The most important are unfavorably located incisions made for phlegmonous processes and the scars of traumatic wounds, the formation of a cicatricial bed as the result of extensive and long-continued suppuration, adhesions to the surrounding tissues, unsatisfactory after-treatment, destruction of the lumbricales and intermediate muscular system with resulting flexion contracture of the terminal phalanx, loss and insufficient repair of the transverse ligaments, and loosening of the sutures in the tendon or of the attachment to the terminal phalanx.

As the result of attempts to overcome these difficulties the author has completely changed his method of tendon repair. In the first place he has given up entirely the free implantation of a transplant into the defect in the flexor tendon. Instead,



most apt to occur during middle age and the senile period, and that hereditary influences must be considered a factor in its development. They state that there is no one known constitutional disease with which it is extensively associated or of which it is a manifestation. It does not appear to be caused specifically by local irritation or traumatism, although these factors as well as local and constitutional pathological conditions may at times have an exciting or contributing influence.

The authors describe the histological changes and the clinical course of the condition.

According to their experience, the contraction occurs more frequently in persons with diabetes than in persons with other diseases.

In general, the methods of treatment may be divided into the following four types.

1. Non-operative treatment.
2. Simple division or subcutaneous division of the contracted fascial bands.
3. Excision of the palmar fascia with closure of the skin.
4. Excision of the skin and palmar fascia with skin grafting or flap shifting to fill the defect.

The authors believe that when the local and general conditions warrant it, excision of the palmar fascia with closure of the skin is the procedure of choice. They give a very detailed description of the different types of treatment and review their own experience with each. H. EARLE CORWELL, M.D.

Blagard, J. D.: Arthritis of the Cervical Spine: Some Neurological Manifestations. *J Am M Ass* 1934, xciv, 96

Blagard states that arthritis of the spine may be a part of a general process including one or more joints of the extremities or may be limited to the vertebral column. The spinal involvement may be confined to certain segments such as the cervical or lumbar spine and not infrequently to only two or three vertebrae. The localization of the process to the bodies of the fifth, sixth, and seventh vertebrae in the majority of cases of cervical arthritis is of interest. This localization may be explained by the assumption that these segments suffer greater functional trauma.

Of the cases studied by the author 58 per cent presented X ray evidence of hypertrophic arthritis of the spine. Sixty-seven per cent of the men and 40 per cent of the women showed such evidence.

Goldthwait and Baber commented on the slightness or absence of symptoms in the presence of extensive pathological changes. Similarly Nielsen has observed that the condition may be latent for years until symptoms are precipitated by trauma, strain, or fatigue.

The author discusses the headaches, symptoms localized to the neck, pain radiating into the arms, numbness and paresthesia of the arms, and efferent (motor) disturbances.

The differential diagnosis of arthritis of the cervical spine involves a consideration of a large

group of intrinsic lesions of the central and peripheral nervous systems, certain general and visceral disease processes, and such conditions as arthritis of the shoulder and other joints of the arms, subdeltoid bursitis, cervical rib, and various lesions of the cervical vertebrae including tuberculosis, fractures, dislocations, new growths (primary and metastatic), osteomalacia, osteomyelitis, and spondylosis. The diagnosis is rendered difficult by the frequent occurrence of extensive vertebral arthritis without symptoms in persons past middle life.

The present methods of treating radiculitis resulting from cervical arthritis are generally conceded to be very unsatisfactory. However the therapeutic measures applicable to arthritis in general are beneficial. Considerable relief of the symptoms is afforded by immobilizing the cervical spine for several weeks in a Thomas collar with short periods of stretching (traction) each day. Blagard recently described a device for the effective application of these principles.

Röntgen irradiation of the spine in repeated small doses has proved definitely beneficial in many cases. Pfender has reported excellent results and attributes them to the decompression resulting from the action of the rays on the connective tissue surrounding the nerve roots in the intervertebral foramina. Among indications demanding special treatment are the prevention of overstretching of paralyzed muscles and of contracture deformity.

The author analyzed the symptoms in 60 cases of arthritis of the cervical spine which constituted 15 per cent of all cases of arthritis of undetermined etiology studied over a period of four years.

Ten illustrative case histories emphasize the complete or relative latency of subjective and objective evidence of the primary lesions of vertebral arthritis as compared with the major manifestations due to the nerve roots which are involved secondarily.

In general it may be said that arthritis of the cervical spine manifests itself by signs and symptoms remote in respect to the spine. Radiculitis may involve any group of nerve fibers confined to a nerve root, that is, somatic and sympathetic, motor and sensory and the symptoms may reflect evidence of irritation or complete or partial loss of function. The symptoms are frequently severe and may simulate those of many visceral, cerebrospinal, local, and general disease entities.

FRANK LEVINE, M.D.

#### SURGERY OF THE BONES, JOINTS, MUSCLES, TENDONS, ETC.

Eckhoff, N. L., and Northfield, D. W. G.: The Results of Treatment of Injuries About the Elbow. *Proc Roy Soc Med Lond*, 1933, xxv, 908

Follow-up examinations were made of eighty-eight in-patients and fifty-nine out-patients who were treated at Guy's Hospital, London, for fractures or dislocation near the elbow. In the in-patients, who were the more seriously injured, the results

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After the resection of the apophysis the iliac fragment with its muscular attachment is replaced in its original anatomical position and fixed with chromic catgut. The sacrolumbar tissues are then returned toward the midline and fixed to the laminae and spinous processes of the vertebrae with a fine catgut suture. The pelvico-lumbar region is then immobilized in a cast.

The immobilization is continued for two or three months or longer. Early mobility of the sacrolumbar structures may stimulate dangerous osteogenic reactions with re-formation of the apophysis and resacralization.

The author reports two cases which he operated upon according to this technique. The first case was that of a woman twenty-eight years of age who complained of pain and tenderness over the left sacrolumbar region and distinct limitation of motion. The roentgen-ray findings were those of an advanced sacralization of the left transverse process of the fifth lumbar vertebra to the ala of the sacrum. The Putti apophysectomy was followed by complete relief of all symptoms.

The second case was that of a man twenty-seven years of age who complained of intense and continuous pain in the left lumbar region and atrophy of the left thigh, and finally became bedridden. Roentgen-ray examination revealed lumbar scoliosis with unilateral sacralization of the left fifth lumbar apophysis. Apophysectomy was followed by the application of a cast. The patient died a few days after the operation, evidently from cardiac insufficiency.

S. L. GOVERNALE, M.D.

Leriche, R. Painful Amputation Stumps (Les douleurs des moignons d'amputation) *Presse méd.*, Par., 1932, xl, 869.

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The subjective symptoms of painful amputation stumps are bizarre in character and distribution, a fact making their interpretation most difficult. That which cannot be understood is usually put by the clinician into the category of the neuroses, and therapy suffers accordingly. Only when the symptoms are analyzed and their origin is determined can successful treatment be administered.

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constant as to be considered normal. The explanation of this phenomenon is simple. Of all the tissues sectioned in an amputation, only the nerve fails to atrophy and become functionless. Attempts at regeneration produce the familiar neurogloma which is subjected to the pressure and the movements of the surrounding tissues. The impulses set up in the divided sensory axons are referred by the sensorium to the amputated extremity. When the sciatic nerve is injected with novocain the patient is no longer conscious of his leg.

If the irritation of the neuroma exceeds the normal limits the sensory impulses are perceived by the patient as pain. The conditions causing such pain are determined largely by the tissue individuality of the patient. This tissue individuality is most easily recognized in laparotomy wounds which are aseptic and heal by first intention. Whereas in one patient a supple, almost invisible scar results, in another the scar is broad, thick, red, painful, and sensitive even to changes in the weather. Similarly, the neuroma which forms after every amputation may in some patients become exuberant and involved in abnormal scar tissue. With healing of the wound the growth capacity of the neuroma is not always exhausted. Occasionally there will be an increase in the size of the neuroma after even two or three years. This fact explains the delay in the development of pain.

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Like the normal illusion of the extremity, the pain is relieved by the injection of novocain into the nerve. If the neuroma is excised the pain ceases until a new neuroma is formed, but if the nerve is sectioned at a distance from the neuroma and carefully sutured the pain is often relieved permanently.

Impulses from the neuroma may affect the sympathetic as well as the spinal system and cause pain of a different character. Nageotte has shown that the Schwann cells of the neuroma may invade the surrounding tissues like a neoplasm and produce a dense cicatricial mass. It appears that these cells have the property of exciting the normal nerve fibers in the area in a manner which thus far has escaped neurological interpretation. In any event the result is a series of vasomotor, trophic, and sensory phenomena which are without fixed topography and are perceived in the stump itself and adjacent areas. The pain is ill defined and often slight, but is constant and thoroughly exasperating. Patients with pain of this character are apt to be treated as malingerers.

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No less important is the attachment at the terminal phalanx. The usual methods of fastening are not sufficient either the stump later tears loose or too close and firm suturing leads to necrosis of the tendon stump. The surer method would consist in encircling the bone with the tendon in the form of a loop. However this cannot be done because the space between the joint and the nail bed is too narrow. The author therefore perforates the bone with a drill and then passes the tendon through the hole to the dorsal surface of the fingers and fastens it to the aponeurosis of the extensor tendon. When the terminal phalanx is very small the tendon may be split up and sutured to the periosteum on each side.

A third problem is the prevention of adhesions. Adhesions form because the free transplant must obtain its nourishment from the surrounding tissues. At first they are delicate, but they become too firm unless passive and active movements are begun early. When the finger motion becomes limited by the formation of adhesions, after an initial period of satisfactory progress in mobilization, it is best to desist from attempts at mobilization for a few weeks until the cicatrizing process has come to a standstill and then to operate. At operation the scar tissue should be removed as thoroughly as possible and the tendon then cocooned in some material which will prevent the formation of new adhesions. Of the material from living sources, the author recommends for this purpose a portion of the saphenous vein or strips of buccal serosa. However it is simpler to use the parchment prepared according to the Lange Pitsen method or the prepared ox serosa which is sold under the name "plastron".

Also of importance is the repair of the transverse ligaments. At first the author believed this to be unnecessary. In a few instances he left scar tissue in the transverse folds of the finger to serve as a substitute for the transverse ligament, but the results were unreliable. Therefore, after healing of the tendon plasty and the attainment of good mobility he now replaces the transverse tendon by surrounding the bone with a piece of tendon and fascia or strips of skin. The most reliable repair of the transverse ligaments is obtained when the work can be done before the repair of the tendon.

Putti, V., and Scaglietti, O.: *Technique of Apophysectomy in Sacralization of the Fifth Lumbar Vertebra* (Tecnica dell'apofisectomia nella sacralizzazione della quinta vertebra lombare). *Chir. e Organi di movimento*, 1932, xvii, 32.

In a review of the literature Putti found the descriptions of four methods of apophysectomy namely, those of Bonriot, Wertheimer, Van Nuch, and Babbini. A critical study of these methods led him to condemn Bonriot's method because of inadequate exposure of the operative field and a number of alleged failures following its use. The other procedures are objectionable because the incision traverses a large mass of muscular tissue difficult to dissect and containing many important vessels or is of such a character as to prevent partial resection of the crest of the ilium for complete removal of the transverse apophysis.

In 1917 Putti performed an apophysectomy on a girl twelve years of age according to the technique advocated by Bonriot. Three months later the patient returned to the Rizzoli Clinic with recurrence of all her symptoms and the sacralized fifth lumbar apophysis even more pronounced than before the operation. As the result of this failure, Putti undertook studies for the development of a new technique. The details of the new procedure may be summarized briefly as follows.

The sites of the second and fifth lumbar transverse processes are determined and marked on the skin with silver nitrate. The patient lies in ventral decubitus in a slightly reversed Fowler position and with overcorrection of the normal lumbar lordosis. The surgeon stands on the side of the sacralized process. A skin incision from 14 to 16 cm. long is made slightly lateral to the midline of the spine from the second lumbar vertebra to the base of the fifth lumbar vertebra and from there obliquely downward and laterally for a distance of from 4 to 6 cm.

Following incision of the aponeurosis of the lumbosacral region the lumbosacral fascia and the long erector spinae group of muscles are separated from the bony spine and retracted during the operation. The lower end of the incision with its external deviation is then extended to the bony layer and a portion of the upper part of the iliac crest 4 or 5 cm. long and 2 or 3 cm. wide is resected. Removal of this crest is particularly important in adults, in whom the fifth lumbar apophysis is more deeply situated than in adolescents. The technique described permits complete exploration of the fifth transverse apophysis also in cases of pelvic deformity such as tilted pelvis and spondylolisthesis. The resection of the iliac crest is done subperiosteally.

The surgical field having been enlarged at the resected iliac crest the fifth lumbar vertebra is located by palpating for the first true transverse process nearest the crest. Immediately distal to the free fourth transverse process is the sacralized portion of the fifth apophysis fused to the ala of the sacrum. All muscular and tendinous insertions to the fourth and fifth lumbar vertebrae are well freed.

On completion of the necessary anatomical orientation with regard to the fourth and fifth transverse processes the sacralized apophysis is removed with an osteome. Care is taken in desacralizing the apophysis to prevent trauma to the lumbar nerves situated under the transverse process and lying upon the anterior fibers of the iliopsoas muscle. It is of paramount importance to remove a sufficient amount of bone to prevent resacralization.

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Pain of sympathetic origin is not altered by section of the spinal nerves, but is relieved temporarily by liberation of the neuroma.

Accompanying the sympathetic pain are cyanosis, edema, osteitis, and excessive atrophy comparable to those observed in an extremity after section of the principal nerve.

The two types of pain just described often occur together.

A third type of disturbance is an extreme hyperaesthesia of the stump. In this condition contact of the clothing causes most violent pain. On the other hand, the stump is almost insensitive to firm palpation and even to rough squeezing. The condition which Leriche believes to be the basis of this peculiar hyperaesthesia was discovered in the course of a radicotomy which revealed intense hyperemia and edema of the arachnoid giving the membrane an inflammatory aspect. This change is regarded as of reflex origin and of the same nature as the cyanosis and edema of the stump. It is conceivable that such reflexes affect even the higher nervous centers and in this way cause the extremely diffuse and strange symptoms of which the patients frequently complain.

The cause of painful stumps is to be found, not in the circumstances of the amputation, but in the constitution of the patient. Primary or secondary closure of the wound and suppuration are without influence.

In the treatment of a patient with a painful stump it is important to know what not to do. The various complaints must never be taken lightly. To prevent incurable drug addiction, treatment must be instituted promptly. Even when the stump is poor reamputation is contra-indicated because it renders final cure more difficult. This is true also of alcohol injections, roentgen-ray treatment, diathermy and resection of the neuroma. These measures generally fail and lead to ultimate disaster—a fact definitely proved by several of Leriche's case histories.

Successful treatment depends upon an early and correct operation.

To facilitate the analysis of the symptoms, local anesthesia may be employed. Injection of the principal nerve trunks should relieve pain of fixed topography referred to the amputated limb, and infiltration about the main artery or paravertebral injection of the ramal should abolish pain of the sympathetic type. When these measures fail the advisability of chordotomy must be considered.

The author outlines the treatment indicated in three different types of cases as follows:

Type 1. Cases of amputation through the thigh with pain in the arm of the foot supplied by the sciatic nerve which is relieved by anaesthesia of the sciatic nerve. In such cases the treatment indicated is section and careful end-to-end suture of the sciatic nerve 10 cm. from the neuroma and injection of from 1 to 2 c.cm. of phenol or chromic acid into the central end of the divided nerve. A long remission or even cure of the pain can be expected.

Type 2. Cases of amputation through the thigh in which the stump is oedematous, cyanotic, ulcerated, and moderately painful. When this condition has been present for only a short time periarterial sympathectomy alone often gives a permanent cure, but for safety the addition of section and suture of the sciatic nerve is advisable. When the condition has been present for a long time and unsuccessful interventions have been undertaken, radicotomy or ganglionectomy should be done. Mild cases in which vasomotor symptoms predominate respond well to periarterial sympathectomy but in old cases with severe pain the treatment should be applied directly to the ganglion. In the upper extremity neurotomy of all of the principal nerves may be necessary in addition.

Type 3. Cases of amputation with diffuse pain in the stump and root of the limb with radiations. In such cases operations on the peripheral nerves are useless. Posterior radicotomy with excision of the spinal ganglion or a chordotomy is demanded. However, as even such radical operations may fail it is probable that surgeons may eventually be led to attempt operations on the cerebral cortex.

ALBERT F. D'OSMONT, M.D.

WILLIAMSON, G. A.: Transplantation of Tendons with Stabilization of Paralytic Talipes. *Surg. Gynec. & Obs.* 93: 93, Ev. 933.

The author states that in the choice of muscles suitable for transplantation the following principles should be borne in mind:

1. The muscle should have an action similar or at least related to that of the muscle to be replaced and must be treated and used as a unit with its tendon and gliding mechanism. An antagonistic muscle proves satisfactory occasionally but only after long training.

2. The strength of the muscle to be transplanted must be nearly that of the muscle to be replaced.

3. The line of pull from the muscle origin to the tendon insertion must be as straight as possible.

4. Proper tendon must be placed on the muscle when the tendon is fixed to the new point of insertion.

5. In order to prevent the formation of adhesions, the gliding mechanism of the tendon must be preserved.

6. All deformities must be corrected before the transplantation is undertaken.

7. Transplanted tendons must be firmly fixed, preferably subperiosteally. Occasionally tendon-to-tendon anastomosis is necessary as, for instance, when the peroneal tendon is transferred into the tendon of Achilles.

In addition to the tendon transplantation, lateral instability due usually to paralysis of the pronators or supinators of the ankle joint, must always be corrected. This is done by arthrodesis operations on the ankle. The method of choice is the triple arthrodesis of Ryerson, in which the subastragalar calcaneocuboid, and astragalocalcoid joints are fused.

The author reports six cases in which good results were obtained following various tendon transplantations. In each of the cases, however, an arthrodexis was performed. **RUDOLPH S. REICH, M.D.**

### FRACTURES AND DISLOCATIONS

Campbell, W. C. Ununited Fractures *Arch Surg.* 1932, LXX, 990

The stages in the healing of a fracture are (1) hemorrhage, (2) the formation of blood clot between the fractured surfaces, (3) cellular invasion with the formation of a fine fibrillar network, (4) the formation of a hyaline and periosseous substance, and (5) calcification. With the exception of the calcification, the process is practically the same as the formation of granulation tissue in the healing of wounds. It has been compared to the setting of the plaster of Paris in the meshes of a crinoline bandage, the crystallization of the plaster corresponding to the precipitation of calcium and the crinoline to the connective tissue matrix.

Two factors essential to ossification are (1) a hyaline matrix in an area of retarded circulation such as a blood clot, and (2) a surrounding area in which there is a sufficient blood supply.

In any discussion of ununited fractures non-union must be distinguished from delayed union. A fracture is usually classed as ununited when there is free motion between the fragments at the end of six months. However there is no time when a distinction between delayed union and non-union can be made arbitrarily. If stability increases, the prognosis for solid union is good.

In a series of 4,771 recent fractures, exclusive of fractures of the neck of the femur, which were observed by the author there were only 4 in which permanent non-union resulted.

The causes of non-union of fractures are constitutional and local. Local causes are by far the more frequent. This is evident from the fact that union can be induced by efficient local measures in over 90 per cent of cases.

In treatment for non-union the patient's general condition should be improved as much as possible and any local and constitutional defect noted on careful routine examination should be corrected.

The only method of treating non-union which is worthy of consideration is the application of a living autogenous bone graft with due consideration of the principles of bone regeneration and repair. Five types of transplants have been employed, namely (1) medullary, (2) osteoperiosteal, (3) chip, (4) inlay, and (5) onlay. The author uses the onlay graft, which he first described in 1923. He believes that this graft best meets the physiological requirements of absolute fixation and the promotion of osteogenesis. He describes the technique of its use in detail and reports the end-results in 104 cases. He draws the following conclusions:

1. Union is accomplished in a shorter space of time by the use of the onlay transplant, as evidenced

by the fact that no motion can be detected from the time the operation is completed.

2. Earlier movement is permitted in adjacent joints and thus function is conserved.

3. The onlay graft increases the dimensions and strength of the bone, maintains its circumference intact, and adds new bone.

4. Even in severe infections, solid union is obtained by the onlay graft in 94 per cent of cases. Therefore infection apparently does not affect the end-result.

5. The operation requires a well-trained team of at least two experts and three assistants, but this is justified by the increased incidence of good results.

6. In any method selected, all of the physiological principles of bone repair and bone transplantation as well as the minute and the gross pathological processes of an ununited fracture must be given consideration if satisfactory results are to be obtained. The use of the onlay graft conforms better than any other procedure to the physiological process of repair. **H. EARLE CONWELL, M.D.**

Landivar, A. F. The Treatment of Fractures of the Forearm in the Adult (*Tratamiento de las fracturas del antebrazo en el adulto*). *Tercer Congreso Argentino de cirugía*, Buenos Aires, 1931.

Landivar considers in detail the anatomy, physiology, roentgen-ray findings, pathological physiology, and treatment of fractures of the forearm. He classifies such fractures as follows:

1. Juxta-articular fractures of the lower extremity
  - a. Radius (1) Porteau-Colles, (2) Goyrand
  - b. Ulna
2. Fractures of the shaft
  - a. Radius
  - b. Ulna
  - c. Radius and ulna
3. Fracture of the ulnar shaft complicated by dislocation of the upper end of the radius (fracture of Monteggia)
4. Fracture of the radial shaft complicated by dislocation of the lower end of the ulna
5. Compound fractures

Restoration of function of the forearm requires equal length of the radius and ulna, normal curvature of the bones, and preservation of the homologous points of the ulna and the lower end of the radius to prevent rotation.

Attention is called to the fact that the pronators are gravity-aided muscles with a long leverage and the supinators are gravity-opposing muscles with a short leverage. Because of these facts the former are the stronger.

The roentgen study of fractures of the forearm should include a frontal view with the arm in extension, the olecranon resting on the table, and the forearm supinated, and a lateral view with the epitrochlea resting on the table and the forearm flexed and in supination (thumb up). From a study of the landmarks, rotation of the fragments can be deter-



mined accurately. All roentgenograms should include the wrist and elbow.

Rotation, particularly of the radius, is an exceedingly important deformity interfering with supination and pronation. All of the author's methods of treating fractures in which this deformity may occur are based on its prevention or correction.

In his general discussion of the treatment of fractures of the forearm Landivar says that because of their economic importance such fractures should be treated only by persons especially trained in their management. They should be reduced early and under local rather than regional anesthesia induced with 1 per cent novocain. The reduction should be as nearly perfect as possible. Roentgenograms should be made before and after the reduction and at the time the patient is discharged. The period of immobilization should be as short as possible. Active movement of the fingers should be begun twenty-four hours after the reduction, and physical therapy should be given early.

In his discussion of each type of fracture, Landivar describes the deformity, gives the causes of its production, and describes the method he believes best suited for its correction.

He reduces the Pottus-Colles fracture with the arm in supination, a walking complete pronation for fear of producing a post reduction rotation of the lower fragment. After the reduction he immobilizes the arm in an impervious plaster splint with slight flexion of the wrist, slight ulnar deviation, and moderate supination.

In intra-articular fractures of the lower end of the ulna he applies a plaster mould from the middle of the arm to the knuckles with the arm flexed at the elbow and the forearm in supination.

In simultaneous fractures of both bones of the forearm closed reduction should be tried before open reduction. Landivar uses the Reehler frame and applies a circular cast from the middle of the arm to the knuckles to immobilize the arm in complete supination with the hand in ulnar flexion and the elbow flexed at a right angle, regardless of the site of the fracture. After three or four weeks physical therapy is started. At the end of eight weeks the splint is removed during the day but is replaced at night for one or two weeks longer. Too early ease causes secondary deformity.

In fractures of the radial shaft, Landivar immobilizes the arm with flexion of 90 degrees at the elbow, complete supination, slight ulnar deviation, and slight flexion of the hand.

Fractures of the ulnar shaft without dislocation of the radial head are rare. If they are not reduced and immobilized correctly they lead to pseudarthrosis and vicious callus formation. The position of fixation should be moderate extension, supination, and radial deviation of the hand.

In cases in which open reduction is necessary Landivar places the patient in the ventral decubitus position with the arm at a right angle to the body and the forearm in complete supination. He approaches

the fracture from the dorsal surface of the forearm. He describes the line of incision, the anastomotic landmarks, and the methods of fixation in detail. The wounds are drained for from twenty-four to forty-eight hours. In closed reduction a longer period of immobilization is required and the immobilization must be complete. Landivar removes metallic prostheses at the end of from thirty-five to forty-five days. He removes them through wounds cut in the splint. He then continues the immobilization for two weeks longer. The position of immobilization is the same as for closed reduction.

The fracture of Monteggia may be high or low. For the low fracture of this type, Landivar advises closed reduction if this is possible. If open reduction is necessary both the fracture and the dislocation should be operated upon. For the high fracture, open reduction is the best procedure. In cases of low Monteggia fracture Landivar immobilizes the arm in acute flexion and supination, and in cases of the high fracture he immobilizes it in extension and begins passive motion at the elbow after two weeks.

Fracture of the radial shaft with dislocation of the lower end of the ulna of 1 1/2 cm. or more must be reduced as it will interfere with function.

Compound fractures of the forearm are classified by Landivar into the following three types:

1. Fractures with a small opening. These usually require only local sterilization with iodine and slight debridement. The wound may then be closed around a capillary drain. The fracture should be reduced as though there was no wound. The drain should be removed at the end of from twenty-four to forty-eight hours. Primary suture without drainage is to be condemned.

2. Fractures with a wide opening. These are dangerous and require wide debridement. The wound should be left open so that continuous or intermittent irrigation may be established if necessary. Depending upon the extent and type of the fracture, reduction may be effected with the use of: (a) a plaster splint immobilizing the wrist and arranged for extension after the manner of Algodon; (b) continuous extension in the frame of Dwyer or the apparatus of Judet; (c) continuous traction with a Thomas splint; or (d) direct or skeletal traction.

3. Fractures with marked osseous and soft part damage (crushing injuries). Such fractures are very serious because of the associated shock. Conservative treatment (debridement, drainage, and immobilization) should be given at first, but amputation may become necessary. The advisability of amputation will depend upon the general reaction and the vitality of the extremity as indicated by the pulse, sensation, and temperature.

WILLIAM R. TORRESCHI, M.D.

Magnum, F. R. The Repair of Ununited Fractures of the Neck of the Femur. *J. Am. M. Ass.* 1934, Nov. 17, 79.

The author's operation consists in reaching out a wide cavity in the obtruded head of the femur

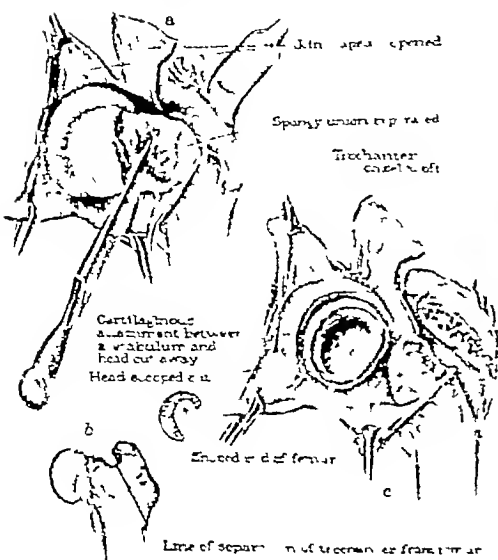


Fig 1 *a*, exposure of joint cavity and fibrous tissue, *b*, line of removal of trochanter, *c*, head and neck of femur shaped to fit each other

without removing it, reshaping the neck to fit into this cavity, cutting off the trochanter, putting the neck into the head, and fastening the trochanter back in a lower position. This is done through a Smith-Petersen incision. No cast is used, bony union not being expected or necessary. A Ranney splint is applied to hold both legs in abduction of 45 degrees. After eight weeks the patient is allowed to get up in a wheel chair.

The operation has been done in ten cases. There has been little surgical shock. It establishes as nearly as possible the normal relation of the head and shaft. The cartilage on the head and in the

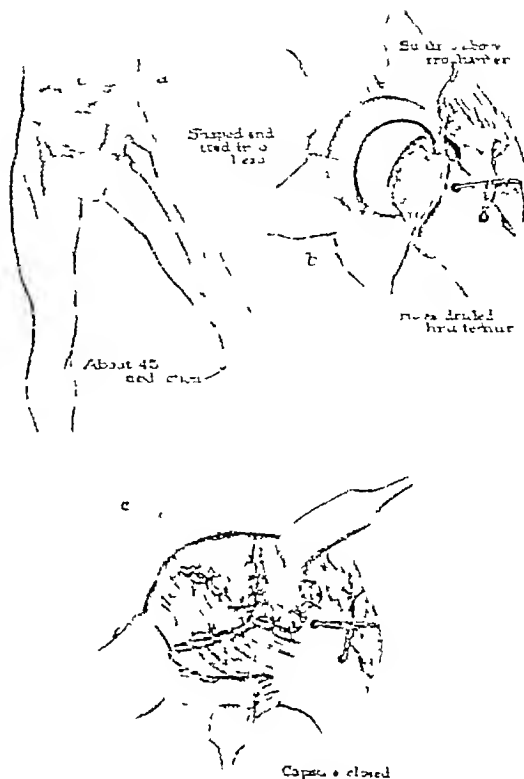


Fig 2 *a*, position in which leg is to be maintained after operation, *b*, normal relations of structures re-established, *c*, completed operation.

acetabulum being preserved, motion is better and there is less pain after this operation than after other reconstruction methods.

WILLIAM ARTHUR CLARK, M.D.

# SURGERY OF THE BLOOD AND LYMPH SYSTEMS

## BLOOD VESSELS

**Basel, L.: Primary Ligation of the Carotid Artery**  
(Sulla legatura della carotide primitiva) *Ann. Ital. di Chir.* 1932 21, 311

The author reports a case in which primary ligation of the carotid artery was done for aneurysm involving the temporoparietal, mandibular, and postauricular region and describes the results of experiments on dogs and rabbits in which the carotid artery was ligated with silk ligatures and pieces of venous tissue.

He concludes that in cases of severe aneurysms the use of silk ligatures is not advisable, but compression of the vessel with venous tissue is safe.

KILLGUS SENES, M.D.

**Perrig, H.: The Anatomy Clinical Picture, and Therapy of Injuries and Aneurysms of the Vertebral Artery** (Zur Anatomie, Klinik und Therapie der Verletzungen und Aneurysmen der Arteria vertebralis) *Beitr. Klin. Chir.* 1931 172.

A detailed review of the literature is presented. After discussing the anatomy and the course of the vertebral artery, its branches, and its variations, the author summarizes the treatment of injuries and aneurysms of this vessel.

As the most certain means of obtaining hemostasis in injuries he recommends ligation at the site of injury or at a preferred site. Central ligation is always advisable first. If possible, the double ligation should be attempted at once sitting. Koenig and Draeger have called attention to the unreliability of single central ligation.

With regard to the treatment of aneurysms, Perrig states that conservative treatment is unreliable. He divides the operative methods into (1) those intended to favor spontaneous healing of the aneurysm by diminishing the blood flow into it (injections, central ligation) (2) incision and tamponade, Koenig's plugging with bits of muscle (3) incision and evacuation after partial or complete interruption of the blood flow (Koenig, Draeger), and (4) Stich's palliative operation, which consists in suturing over an autoplasmically transplanted strip of fascia. The last method has not yet been used on the vertebral artery.

The indication for operation on aneurysm of the vertebral artery should not be judged too exclusively from the operative standpoint.

A case of injury to the vertebral artery in which von Brun operated is reported with a detailed analysis of the neurological symptoms (cerebral anoxia and brachial plexus symptoms).

HILGERS (2)

**Bartsch, G. H.: Subcutaneous Traumatic Rupture of the Popliteal Artery** (Über subcutane traumatische Rupturen der Kniekehlenarterie) *Wiener Klin. Wochenschr.* 1932 4, 1241.

In civil life vascular injuries are not frequent and subcutaneous vascular injuries caused by blunt force are particularly rare. The author reports three cases of subcutaneous rupture of the popliteal artery due to blunt force with subsequent progress of the leg.

In the first case the patient was struck in the popliteal space by the lever of a brake. In the two other cases the injury was caused by the passage of a wheel over the knee region.

The popliteal artery is subjected to blunt injury relatively frequently because the lower extremities are more exposed to trauma than other regions of the body and, in addition, the location of the vessel and its connective tissue fixation above and below the popliteal space play a role. As the vessel is fixed at two points, any injury that produces overstretching is particularly dangerous. As the tension is limited to the segment between the points of fixation, it is very liable to result in rupture. Injury is favored also by the fact that the vessel lies over the hard resistance of the popliteal space against which it may be squeezed by the contracting power of the muscles.

The prognosis of the injury is unfavorable in none of the thirty-four cases collected by Schmidt from the literature was it possible to save the injured extremity. Prompt recognition of the injury to the vessel is important as early in the early stages as vessel suture be carried out with hope of success. Swelling appearing immediately after blunt force has been applied to the popliteal space, absence of the pulse in the peripheral arteries, and disturbance of sensation should suggest the possibility of rupture of the popliteal artery. In doubtful cases exploratory exposure of the artery should be done. If the artery is found ruptured the choice of operation must be governed by the conditions present. If possible, the attempt should be made to restore the vascular tube by suture even if this is technically difficult.

MAXIMILIAN HUBER (2)

**Das Santos, R., Lamas, C., and Caldas, P.: Arteriography of the Limbs** (L'arteriographie des membres) *Bull. et Mem. Soc. med. de Chir.* 1932, 1111, 423.

Das Santos introduced arteriography with sodium iodide in 1929. As he has since found that sodium iodide is irritating to the endothelium of the vessels and sometimes causes obstruction or gangrene, he has been experimenting with different injection materials. As the result of his investigations he has



Fig 1 Aneurysm of popliteal artery Arteriography with thorotrast two days before operation

and the collateral circulation. In one of the authors' cases of aneurysm of the popliteal artery four arteriograms were made, one before and three after the operation. This procedure caused no circulatory disturbance and made it possible to follow up the development of the collateral circulation.

In the suturing of arteries arteriography is the only means of verifying the result and making sure that the artery is permeable. Aneurysms that are almost completely obstructed by clots and barely allow the contrast fluid to pass are the ones that show the greatest pulsation and expansion.

Arteriography is of value not only in cases of vascular lesions, but also in cases of tumors, which frequently are difficult to differentiate from osteomyelitis. In osteomyelitis, ischæmia is almost always present. In arteriograms of tumors the most striking finding is the new formation of vessels; the picture differs essentially from that of inflammatory hyperæmia. Ischæmia is present also in syphilis of bone. In this condition arteriography shows not only the vessel structure in tumors, but also the results of treatment.



Fig 2 Same case as in Fig 1 Arteriography eight days after the Matas operation. First stage in development of collateral circulation

discovered that thorium hinoxide or thorotrast is nonirritating. The injection should be made slowly and, as thorotrast is quite viscid with a rather coarse needle. Use should be made of an apparatus by which the pressure and the amount of thorotrast injected can be controlled. If too little of the thorotrast is injected, only the larger vessels will be rendered visible, and if too much is injected the veins will also be injected and the picture will be complicated. The pressure should be from 1.5 to 2 kgm, and the amount of thorotrast injected from 10 to 20 c.cm, depending on the region. In aneurysms, somewhat more thorotrast should be used in order to fill the sac. Stereoroentgenograms should be taken. This can be done without interrupting the injection by means of a special apparatus. Arteriography will show the nature of an aneurysm, its relation to the vessel, the permeability of the sac,



Fig. 3 Same case as in Figs. 1 and 2. Arteriography two months after the Maine operation. Marked development of collateral circulation.

The article contains a number of arteriograms made in cases of aneurism, vessel aneurism, and tumor.

ARTHUR GOS MORRIS, M.D.

Cottalorda, J. Effort Thrombophlebitis (Thrombophlebitis per effort) *Lyon chir* 1932 xdx, 69.

The author reviews the history and discusses the etiology, symptoms, clinical forms, diagnosis, and pathology of effort thrombophlebitis. He states that the condition is directly traceable to trauma, either acute, more or less sudden, and violent, or insidious, repeated, and chronic. It occurs more often in males than in females, and much more frequently in the arm than in the leg. Cottalorda reports three cases of his own and cites twenty-six others.

The theory ascribing the condition to traumatic injury of the intima of the veins does not explain all cases. The theory attributing it to infection has been largely abandoned as blood cultures are never positive and in only two instances have organisms been

grown from the clot. The theory that it is due to a disturbance of the sympathetics seems to be the most valid because at operation the vein is occasionally found free from clot whereas arterial changes and a local disturbance in the tension are present and operative treatment by simple removal of the clot, local resection of the vein, or resection of the vein and perivascular sympathectomy gives indisputably better and quicker results than medical treatment. Under expectant treatment alone, marked permanent disability may persist.

The author believes that the syndrome starts with a spasm of the vein from sympathetic irritation.

The treatment should be expectant at first. If there is aggravation or no improvement of the symptoms after several days, surgery should be undertaken. This should consist of resection of the affected portion of the vein and perivascular sympathectomy on the accompanying artery.

FALKE B. BERRY, M.D.

Jacques, L. Varicophlebitis and the Injection Treatment. *Ann. Surg.* 1932, xcv, 745.

Jacques presents clinical evidence indicating the presence of latent infection in the walls of varicose veins. He says that the danger of the injection treatment of varicose veins are due in part to the lighting up of such infection with resulting ascending thrombophlebitis and embolism. Evidence of the presence of latent infection in the veins of one extremity should suggest the likelihood of stirring up such an infection in the other extremity. The development of methods of detecting latent infection will aid in eliminating an important source of danger associated with injection therapy.

ELIZABETH CRAMPTON.

## BLOOD TRANSFUSION

Barney, J. D., Hunter, F. T., and Mink, E. R. The Urinological Aspects of Radioactive Tumors of the Blood-Forming Organs. *J. Am. M. Ass.* 1932 xcvi, 245.

By the term "radioactive tumors of the blood-forming organs" the authors refer to tumors arising from primitive cells of lymph nodes, bone marrow, and the spleen. The Maffey terms are "lymphoblastoma" and "myeloblastoma."

Lymphoblastomatous conditions may be divided clinically into the following six subgroups: lymphatic leukemia, aleukemic lymphatic leukemia, Hodgkin's disease, mycosis fungoides, lymphosarcoma, and pseudoleukemia or lymphadenoma. These types may or may not be distinct.

Of thirty-nine cases of lymphoblastoma collected by the authors thirteen presented clinical manifestations of involvement of the genito-urinary tract and in ten without such clinical manifestations involvement of the genito-urinary tract was found at autopsy.

Of twelve cases of myeloblastoma collected, two showed clinical evidences of genito-urinary tract

involvement, and in eight without such clinical manifestations, involvement of the genito-urinary tract was found at autopsy

Among the thirteen cases of lymphoblastoma and two cases of myeloblastoma with clinical signs and symptoms of genito-urinary tract involvement there were six with a mass in one or both flanks, one with enlargement of the prostate and retention, four with pain in the back, two with enlargement of the testes, and seven with hæmaturia and pyuria. In a case of lymphoblastoma of the spleen an operation for perinephritic abscess was narrowly averted, and in another case of lymphoblastoma a kidney was explored because of severe cystitis and pyuria.

Myeloblastoma invades the urinary tract less frequently, but often gives rise to hæmaturia because of the associated purpuric tendency. In cases of tumor of this type, pronounced and persistent priapism may occur.

The only treatment of value in these conditions is high voltage roentgen therapy or, in special cases the external application of radium. Surgery is usually contra-indicated except for diagnosis. The tumors of both types are fatal. The myeloblastoma usually causes death within from two to four years

in cases of the chronic type and in from six weeks to six months in cases of the acute type. In cases of lymphoblastoma the prognosis is more difficult. The average length of survival is from two to four years but in one of the cases cited by the authors the patient lived for seventeen years after biopsy.

WILLARD J. KISER, M.D.

#### LYMPH GLANDS AND LYMPHATIC VESSELS

Moriconi, L. The Repair Process in Wounds of the Lymph Glands (*Il processo di riparazione delle ferite delle ghiandole linfatiche*) *Arch. ital. di chir.*, 1932, xxxi, 301.

Following a review of experimental research by others on regenerative processes in the lymph glands and repair of the lymphatic tissue of the spleen, the author reports experiments in which he studied the repair following the incision of mesenteric and inguinal lymph nodes. On microscopic examination he found that wounds of lymph glands are repaired simply by connective tissue. Hæmorrhagic infiltration causes partial destruction of the parenchyma and the regions destroyed are replaced by connective tissue.

A. LOUIS ROSE, M.D.

# SURGICAL TECHNIQUE

## OPERATIVE SURGERY AND TECHNIQUE; POSTOPERATIVE TREATMENT

Heitz Boyer: The Action and Method of Use of the Electrical Knife in the Treatment of Cancer (Action et emploi du bistouri électrique dans le traitement du cancer). *Bull. et mém. Soc. nat. de chir.* 93: 1714, 449.

The value of the electrical knife in the production of hemostasis and the prevention of infection and shock has been well established, but its ultimate value in cancer can be known only after the elapse of several years. However, experience to date permits a few conclusions.

In certain regions, particularly the axilla and the neck, the use of the electrical knife is definitely contra-indicated because of the danger of perforation or thrombosis of the large vessels. This danger exists even for the experienced operator who is thoroughly familiar with the properties of the current. When it is possible to cut wide of the tumor, as for example in cases of localized masses in the breast, the use of the electrical knife has few advantages.

In operations in infected fields, particularly in cavities such as the rectum, colon, upper respiratory tract, and uterus, the electrical knife is of great service because it closes the routes of infection and absorption. This is true also when a breach is left in cellular tissue, as when the rectum is removed or a large tumor is resected from the bladder. Defects in the bladder wall have been left unsutured with out outward results. In cases of diffuse tumors of the breast and face, repeated sections can be made even through cancerous tissue without danger of disseminating the tumor cells. Because of the hemostatic properties of the knife it may be used to remove localized tumors of the brain, liver, spleen, and prostate.

The author shows the effects of the cutting current on the tissues along the line of the incision by a series of photomicrographs. Blood vessels and lymphatics are occluded and cancer cells destroyed.

The occlusion of the lymphatics may be demonstrated experimentally by powdering a wound in the mammary region of a guinea pig with carmin. When an ordinary scalpel is used the regional lymph nodes become rapidly charged with pigment, whereas when the wound is made with the electrical knife none of the carmin is absorbed.

The use of the electrical knife requires a certain amount of experience. The type of current is also of great importance. All grades of action can be obtained from a superficial desiccation through electrocoagulation to a clean section differing hardly at all from the cut of a scalpel.

In collaboration with Condet, the author has devised an apparatus delivering a mixed current with both coagulating and cutting properties. The degrees of each action can be varied as desired. In a cancerous area the current should be predominantly coagulating.

The knife must be handled delicately because the more lightly it is applied the more easily the tissues are sectioned. Paradoxically, firm tissues, such as tendon and fascia, are divided more readily than fat and areolar tissue.

ALBERT F. DE GOUX, M.D.

Perrowe G. L., Jr.: The Solution of Cholels in Proctocolysis. *Surg. Gynec. & Obst.*, 1934, 59: 779.

The purpose of proctocolysis is the establishment and maintenance of water balance in cases in which it is impossible or inadvisable to administer fluid by mouth. Proctocolysis is used instead of hypodermoclysis and intravenous infusion in any but acute conditions and in conjunction with these methods in acute conditions. In the author's opinion such administration of fluid is thoroughly adequate and physiological.

Of the proctocolyses studied by Perrowe a 2 per cent solution of glucose was found to be best. When this is combined with a 0.5 per cent solution of sodium bicarbonate the rate of absorption is somewhat lowered, but the effect in the combating of acidosis is possibly greater.

Of the solutions of inorganic salts studied, a 0.5 per cent solution of sodium bicarbonate was found superior to others in the rate of absorption.

Isotonicity is not the ideal concentration for its use; such a concentration we are neglecting one of the best properties of the gut—its action as a semipermeable membrane. A solution which is definitely hypotonic to the blood is more readily absorbed. As regard to the glucose solutions we may consider that the selective activity of the gut comes into play.

HOWARD A. McKENNEY, M.D.

Boehamer K.: Is Thyroid Hormone Effective in Preventing Postoperative Thrombosis and Embolism? (Ist das Schilddrüsenhormon gegen postoperative Thrombosen und Embolien wirksam?). *Zentralbl. f. Chir.* 93: 85.

Boehamer disagrees with the view of Trendelenburg that two cases of thyrotoxicosis with fatal postoperative pulmonary embolism and concluded that they refuted the theory that the thyroid hormone is an effective prophylactic against thrombosis and embolism. He refers to the report on his studies of the metabolism of thrombotic patients (*Deutsch. Zool. f. Chir.* 1929, vol. 93) in which he disproved Trendelenburg's theory that hypothyroidism is the cause of thrombosis and that therefore the prophylactic adminis-

tration of thyroxin constitutes a direct substitution therapy

He seeks the primary cause in an effect on the vegetative nervous system, and attributes the greatest importance to vagotonic hypertonia of the abdominal organs, particularly of the liver. However, as pure vagotonia or sympathicotonia has not been observed in man, it must be assumed that there is a general disturbance of the vegetative nervous system. The investigations of Isaak and Reiter (*Deutsch med Wchschr*, 1931, No 38), in which increased irritability of the vagus nerve in Basedow's disease was revealed by blood-sugar determinations after the administration of insulin, confirm this view.

Therefore, in Basedow's disease, in addition to hypertonia of the sympathetic, there is an increased reactivity of certain organs to parasympathetic stimulation. Accordingly, thyroxin should be given, not for the purpose of relieving a possible deficiency of thyroid hormone, but to offset the vagotonic effects of the operation. It should prevent the increased vagotonia of the abdominal organs and increase diuresis, permitting more rapid elimination of the products of cell destruction. Since the latter may lead to an undesirable concentration of the blood, adequate administration of fluids in the form of Ringer's solution is necessary. E. TRAUM (Z)

Sanguigno, L. The Etiopathogenesis of Postoperative Parotitis (Sull'etiopatogenesi della parotite postoperatoria). *Riforma med*, 1932, xlviii, 478

The author reports a case of postoperative parotitis and reviews 132 cases collected from the recent literature.

The organisms commonly causing this condition include the bacteria usually present in the oral cavity and the staphylococcus aureus, the colon bacillus, and occasionally the gonococcus.

The theory that the condition is due to a genio-parotid reflex has not been supported by the author's statistical study or the reports of well-informed institutions. Several autopsy reports indicate that the infection may reach the gland by way of the lymphatics, producing an intraparotid lymphadenitis. The theory that the condition is of stomatogenic or ascending canalicular origin, although having much in its favor, is not definitely proved by bacteriological and histological observations. The theory that it is of hæmatogenic origin also fails to find support in numerous cases.

Parotitis occurs most frequently after operations on the digestive tract and genital organs, especially in the female. It may be brought about by postoperative bacteræmia with salivary stasis, a genio-parotid reflex, or unhygienic conditions of the mouth alone, but in some cases 2 or more causes may be present simultaneously.

The author concludes that the various theories are applicable to individual cases, but no one theory will explain all cases. As a rule numerous factors are active.

PETER A. ROSI, M.D.

Vigýázó, J. Postoperative Parotitis, Its Pathogenesis, Prognosis, and Treatment (Zur Frage der postoperativen Parotitis, ihrer Pathogenese, Prognose und Therapie). *Zentralbl f Chir*, 1931, p 3197

The author discusses the so-called postoperative sialoadenitis, a serious complication occurring most frequently after laparotomies, and reports two cases. His patients were women eighty-one and sixty-five years of age. The former was treated operatively and the latter conservatively. The author's observations are summarized briefly as follows.

There are two types of postoperative parotitis. One is septic and metastatic, and the other, an oral ascending infection. The differential diagnosis is based upon the escape of pus from Stensen's duct. The oral infection, in which the duct empties pus, is relatively benign and amenable to conservative treatment. Careful oral hygiene, forced chewing movements (chewing gum), stimulation of the secretion of saliva, and discharge of saliva (ingestion of solid food, injections of pilocarpin, and frequent evacuation of the gland by massage) may quickly result in cure. E. GLASS (Z)

#### ANTISEPTIC SURGERY, TREATMENT OF WOUNDS AND INFECTIONS

Glover, D. M. Six Years of Tannic Acid Treatment of Burns. *Surg, Gynec & Obst*, 1932, lii, 798

Statistics to date show a marked reduction in the mortality from burns when tannic acid treatment is used. Harris reports a reduction of the mortality from 26.6 to 12 per cent, and Herzfeld and Wilson a reduction from 38 to 9 or 9.5 per cent. Glover reports that in 121 cases of burns treated by various methods the mortality was 14 per cent, whereas in 310 cases treated by the tannic acid method it was 9.6 per cent.

Tannic acid treatment is comfortable for the patient. After the formation of a firm coagulum over the burned area, which usually requires from twelve to twenty-four hours, little attention need be paid to this area for about a week. During this time the patient is relatively comfortable under his lighted cradle tent.

The data obtained by the author indicate also that the incidence of septic complications in burns is much lower when the tannic acid treatment is used than when any other treatment is given.

There can be little doubt that the tannic acid method is practical and economical.

Burns should be regarded as emergencies and treated as early as possible. In the tannic acid treatment the burned areas are sprayed with a 5 or 10 per cent solution of tannic acid while the patient remains under a lighted cradle. In addition, an amount of fluid sufficient to combat dehydration is given, but care is taken not to overload the circulation with fluid.

During the secondary toxic stage, continuous dressings wet with Dakin's solution are applied to



hasten separation of the coagulum. Early skin grafting is advisable to prevent the development of a profound secondary anemia, diminish the danger of late septic complications, and prevent unnecessary scarring and contracture.

The treatment of chemical or electrical burns is based on the same principles as the treatment of burns caused by heat.

HOWARD A. MCKENZIE, M.D.

Chavannes, J., and Fontan, A.: Preventive Anti-tetanus Serotherapy (De la sérothérapie préventive antitétanique) *Bulletin chir.* 1911 No. 2 14

In August, 1914, the authors saw a man who had a wound of the wrist caused by a fall on a bottle fragment. Under their observation hyperacute tetanus developed and terminated in death. Six weeks later they observed wounded soldiers from the battle of the Marne with more or less delayed tetanus which in some instances began atypically with retention of urine.

Since 1918 the injection of serum combined with careful cleansing of the wound has greatly reduced the incidence of tetanus. In ten years of hospital work Chavannes and Fontan saw only one case of tetanus. The patient was an obese woman with retrocaval appendicitis who was operated upon on the fifth day of the attack. Tetanus developed eight days after the operation. The condition was recognized at the beginning and the patient recovered.

In the last two years the authors have observed a larger number of cases. In August, 1930, they were called to see a young man who a week previously had cut his heel on something in plunging into a stream. The wound was deep and irregular. Generalized tetanus began on the morning of the seventh day and, in spite of treatment, was fatal in twenty four hours.

For the development of tetanus it is not necessary for the wound to be irregular, dirty and infected and to contain foreign bodies. Any one of these conditions is sufficient. An athlete contracted tetanus after a prick with a spiked shoe, but recovered. A woman died of hyperacute tetanus from getting a splinter under her nail, and a child died of tetanus after a wasp sting. FACK.

Tabanelli, M.: Some Cases of Actinomycosis (Su alcuni casi di actinomicosi) *Clin. chir.* 1932, VIII, 293.

The author reports 5 proved cases of actinomycosis which were observed in the Royal Surgical Clinic of Milan during the period from 1925 to 1931. These were discovered among 322 cases of cervical, 400 cases of thoracic, 293 cases of abdominal, and 673 cases of osseous inflammatory suppurative lesions.

Because of the difficulty in the diagnosis, most cases of actinomycosis do not come for treatment until late. The treatment consists of operation,

roentgen irradiation, and the administration of potassium iodide. As a rule it is only palliative.

ERNEST T. LEECH, M.D.

Manson, M. H.: Pathogenic Gas-Producing Anaerobic Bacilli in Chronic Ulcers. *Arch. Surg.* 1912 XIV 752

The author reports two cases of violent gas gangrene following the amputation of extremities that were the site of chronic ulcers, discusses the possible relationship of the ulcers to the gas-bacillus infection, and reviews the findings of a bacteriological study of chronic ulcerating lesions with particular reference to the presence of gas-producing anaerobes.

In one of Manson's cases diabetes was present and the ulcer and associated infection had a deleterious influence upon it. The other patient had syphilis and a painful ulcer of the heel. In both cases the ulcer-bearing extremity was amputated below the knee, marked disability was caused by pain, and gas gangrene developed in the amputation stump on the third day after the operation. There was no reason to suspect gas-bacillus infection in the ulcers prior to the amputation.

The techniques of the isolation of anaerobes and the pathogenicity and differentiation of the organisms are discussed.

The pathogenic anaerobes found most frequently in chronic ulcers are the clostridium welchii. The author discusses the possible routes of infection and concludes that in the cases he reports the organisms were probably present in the tissues prior to the amputation. He states that polymicrobial and bacillus perfringens infections is of definite value and should be used more frequently. He suggests that chronic ulcerating lesions be cultured in milk before their surgical removal is attempted. If the characteristic stormy fermentation produced by the clostridium welchii is noted anaerobic antibiotic should be administered before the operation.

ERNEST C. ROSENBERG, M.D.

Astural, A.: The Bacteriophage and Its Application to Surgical Infections (La doctrine du bactériophage e la cura batteriologica nelle infezioni chirurgiche) *Rivista med.* 1931, XLVII, 694.

After briefly reviewing the history of the bacteriophage and the theory of its use in surgery the author reports twenty nine cases of different forms of staphylococcal infection which he treated with bacteriophage and followed up from the clinical, bacteriological, and immunological points of view. As he was able to demonstrate antiphages repeatedly and for a time longer than that necessary for lytic action, and as inflammatory changes are not adopted in the development of the bacteriophage, probably as a result of their acid reaction, he concludes that in the present state of our knowledge the bacteriophage, which is not always harmless, cannot be used in the treatment of such lesions.

ERNEST T. LEECH, M.D.

## ANÆSTHESIA

Bolliger, A. The Detoxicating Properties of Sodium Thiosulphate in Avertin Intoxication. An Experimental Study. *Med J Australia*, 1932, 1, 125

After the author's work demonstrating a decrease in the sodium thiosulphate excretion during complicated and uncomplicated pregnancy and the puerperium in human beings and dogs, it was thought that some of the thiosulphate might be used in a process of detoxication peculiar to certain pregnancies. This theory led to experimental work on dogs to demonstrate the detoxicating properties of sodium thiosulphate, if any, in a standardized intoxication produced experimentally with avertin administered rectally.

In twenty experiments performed on ten dogs avertin was administered rectally and intravenous and subcutaneous injections of sodium thiosulphate were given. In previous work the minimum lethal dose of avertin in the dog was found to be below 0.7 cc per kilogram of body weight. The experiments demonstrated a detoxicating effect of sodium thiosulphate given intravenously and subcutaneously in avertin intoxication. The effect was slight and of uncertain magnitude.

In a series of nine experiments in which avertin and hypertonic sodium thiosulphate were administered simultaneously by rectum a delay in the absorption of the avertin was demonstrated. When a 30 per cent solution of sodium thiosulphate was used it became almost impossible to induce avertin anaesthesia.

In ten experiments very large doses of avertin were administered and after cardiac failure a high rectal irrigation of a warm 30 per cent sodium thiosulphate solution was given. In three instances the irrigation acted as a restorative. By the same procedure it was possible to restore an animal on the verge of respiratory failure.

For three days following avertin anaesthesia an increased tolerance for avertin of small magnitude was demonstrated.

In some experiments sodium thiosulphate was retained to a somewhat greater extent than phenolsulphonaphthalein, and during avertin anaesthesia, sodium thiosulphate was absorbed from the intestine and excreted in the urine in appreciable amounts. In avertin anaesthesia the sodium thiosulphate had a strongly diuretic effect.

J. EDWIN KIRKPATRICK, M.D.

SeEVERS, M. H., and WATERS, R. M. Circulatory Changes During Spinal Anaesthesia. *Anes & Anal*, 1932, 21, 85

The authors state that the study of the factors involved in the circulatory depression occurring in spinal anaesthesia has been retarded by the general belief that the cause is visceral vasodilatation resulting from splanchnic nerve paralysis. One of the chief causes of this depression is cellular oxygen

want. Several factors produce a vicious cycle, lowering of the blood pressure resulting in a decrease in central vasoconstrictor tone, and the decrease in the central vasoconstrictor tone resulting in further lowering of the blood pressure.

Physiologists have long recognized the importance of skeletal muscle tone and contractility in the movement of capillary and venous blood. One of the factors in the circulatory depression of spinal anaesthesia is functional severance of the motor nerves to over half of the skeletal muscles.

A secondary factor in the vascular muscle tone is the acid-base balance of the blood. An increase in the hydrogen-ion concentration of the blood lowers the vascular muscle tone. Studies of the blood and alveolar oxygen in patients and of the arterial blood in dogs under spinal anaesthesia showed the oxygen tension in the tissues to be relatively low during the period of circulatory depression. Samples of venous blood after spinal anaesthesia with circulatory depression showed a lowered oxygen content and capacity with a raised carbon dioxide content, a decrease in the carbon dioxide capacity, and a decrease in the hydrogen-ion concentration. Samples of alveolar air showed an oxygen shortage and carbon dioxide increase of about the same grade as that following the use of other respiratory depressants such as the barbiturates.

Another factor in the circulatory depression of spinal anaesthesia is intercostal nerve paralysis. In experiments on dogs, section of the intercostal nerves resulted in a gradual fall in the blood pressure in twenty-four minutes from 116 to 54 mm Hg. The gradual nature of the drop suggested that the decrease was due to oxygen want.

In animals in which the intercostal nerves were sectioned the authors were able to maintain or restore the normal blood pressure by maintaining normal chest activity with the use of an artificial respirator of the Drinker type. Following high cervical block, normal pressures were maintained for relatively long periods of time.

The theory that the circulatory depression of spinal anaesthesia is due primarily to oxygen want is supported clinically by the fact that patients who were instructed to breathe deeply or who were given oxygen-rich mixtures maintained a better blood pressure, felt better, and were less nauseated than others. The authors therefore suggest the administration of oxygen-rich mixtures to patients under spinal anaesthesia to prevent or overcome circulatory collapse.

Ephedrin given previous to the induction of spinal anaesthesia tends to maintain normal blood pressure, but after the blood pressure has dropped it is less prompt and less effective in its action, and when the blood pressure is low it may not only fail to restore the pressure to normal but may prove toxic to the myocardium.

The authors conclude that the treatment of accidents following spinal anaesthesia should consist of two-phase artificial respiration plus the intravenous

administration of ephedrin in a dosage sufficient to maintain the blood pressure at the pre-anesthesia level. They have found that in animals the circulatory depression occurring in spinal anesthesia is much more marked when barbital, ethylene, or nitrous oxide is given or morphine or scopalamine is administered as a pre-operative sedative than when spinal anesthesia is induced without supplementary measures. WILLARD J. KIRK, M.D.

Copello, O., Dinaltri, V., and Nalen, J.: Lumbosacral Radicular Paralysis Following Spinal Anesthesia (Parálisis radicular lumbosacra post raquíanestesia). *Seminars med.*, 935, xxix, 549.

The author reports the case of a woman who entered the hospital to be operated upon for chronic appendicitis. Physical examination revealed the usual signs of pain on pressure in the right iliac fossa. The operation was performed under spinal anesthesia induced with novocain. At the time of the spinal puncture the patient noticed that her left leg moved automatically; there was a continuous extension and flexion which she was unable to prevent. She had no pain. During the operation nothing

abnormal occurred. After the operation the patient experienced severe pain in the right leg when she was lifted and the left leg remained anesthetized. When she tried to stand she found it impossible to move the left leg. The left leg was insensible to touch, heat, and pain and also to treatment of a severe burn which had been caused by a hot water bag. Later the patient complained of pain in the lumbar region which was localized at the site of the puncture and radiated to the inguinal and gluteal regions of the left side. There was no dysuria. Even light pressure on the lumbosacral region on the left side caused intense discomfort. There appeared to be a definite hyperesthesia of this entire region. A diagnosis of paralysis following spinal anesthesia was made.

Six months after the operation the condition remained practically the same. The only improvement was a slight increase of muscular power in the paralyzed extremity.

The authors believe that there was an injury to the cauda equina, and that this may have been due to a hematoma which was responsible also for the persistence of the paralysis. A. E. TAYLOR, M.D.

# PHYSICOCHEMICAL METHODS IN SURGERY

## ROENTGENOLOGY

Cammarano, P. The Treatment of Mal Perforant, with Special Reference to Roentgen Therapy (La terapia del mal perforante plantare con speciale riguardo alla roentgenterapia) *Clin chir*, 1932, VIII, 296

The author reports five cases of mal perforant. Three of the patients were young adults and two were elderly. Most of the lesions were typically situated on the sole of the foot. The onset of the condition was slow and unnoticed. Three of the patients were free from lues and the two others were not benefited by antiluetic therapy. All of them were engaged in occupations which required standing most of the day. Three had more or less extensive hypæsthesia and two had hyperhidrosis. All five were treated by the method of Busi, i.e., irradiation of the lower dorsal and lumbar spine. Complete cure resulted in two, marked improvement in two, and healing of some of the lesions in one.

This method of treatment has the advantage that it allows the patient to continue his usual work. When it is employed correctly it is relatively harmless and painless. Its success is probably due to its effect on the site of the disease in the spinal ganglia.

In reviewing the various methods which have been employed for mal perforant the author agrees with De Gaetano that as a rule the X-ray treatment described is best. If this fails, stretching of the main nerve trunks in the leg may be tried. If this fails also, the same procedure may be applied to the sciatic nerve. The author has entirely discarded penarterial sympathectomy. A. Louis Rosi, M.D.

Hintze. The Results of Operative and Irradiation Therapy in Carcinoma of the Skin and Mammary Gland (Die Erfolge der operativen und der Bestrahlungsbehandlung beim Carcinom der Haut und der Brustdrüse) 56 Tag d. deutsch. Ges. f. Chir., Berlin, 1932.

This report is based on cases of carcinoma of the skin and mammary gland treated at Bier's clinic and the Roentgen-Radium Institute. The cases of carcinoma of the skin were treated in the period from 1912 to 1931, and those of carcinoma of the mammary gland in the period from 1912 to 1930. The course of the condition was determined in 95 per cent of the cases.

Of the cases of cancer of the skin, a small number which were especially favorable were first operated upon. All of the others were irradiated. Of the patients operated upon, a considerable number returned for irradiation of a recurrence. A smaller number were operated upon after primary irradiation. Only a few were given prophylactic irradiation.

In the cases of carcinoma of the breast a primary radical operation was done in all except in those which were definitely inoperable and the few operable cases in which the patient refused operation. Prophylactic secondary irradiation has been carried out in an increasing percentage of cases since 1914. All recurrences were also irradiated. Treatment by irradiation alone was given in only a few cases besides those which were inoperable. Up to five years ago only the roentgen rays were used as a rule. Since then radium has been employed in about a third of the cases instead of, or as a supplement to, the roentgen rays. It has been used for contact irradiation for superficial carcinomata up to 2.5 cm in diameter and single skin recurrences after amputation of the breast, and for irradiation at a distance of 2 cm for more deeply lying infiltrations or nodes.

Of the 486 patients treated for carcinoma of the skin from five to twenty years ago, 469 were followed up. Of the latter, 279 (61.1 per cent) have survived and 167 (34.3 per cent) have been free from symptoms for five years or more. Of 317 patients treated ten or more years ago, 302 (95.26 per cent) were followed up. Of these, 127 (40.06 per cent) have survived and 72 (22.71 per cent) have been free from symptoms for ten years or more.

The results of the various types of treatment of carcinoma of the skin after a period of five years or more are as follows:

Of 130 patients treated only by operation, 80 (61.5 per cent) are living and 48 (37.0 per cent) are asymptomatic, and of those operated upon only once 72 (55.3 per cent) are living and 44 (33.8 per cent) are asymptomatic. Of 81 patients operated upon first and irradiated later, 55 (67.9 per cent) are living and 24 (29.6 per cent) are asymptomatic. Of 21 patients given prophylactic irradiation, 10 (47.6 per cent) are living and 6 (28.6 per cent) are asymptomatic. Of 41 patients irradiated first and operated upon later, 32 (78.0 per cent) are living and 6 (14.6 per cent) are asymptomatic. Of 213 patients treated only by irradiation, 120 (56.3 per cent) are living and 83 (39.0 per cent) are asymptomatic.

The average age of all of the patients with carcinoma of the skin was sixty-one years. As compared with the normal death rate, there was an excess mortality of 17 per cent after three years and of 22 per cent after five years. In the cases in which the lesion was on the forehead, temple, cheek, or nose, the majority of the deaths had no relationship to the disease, but in those in which the lesion was in the region of the eyes and on the extremities the majority of the deaths were attributable to the disease. The primary postoperative mortality was only 5 deaths. The author draws the following conclusions:

In superficial carcinoma of the skin a permanent cure can be obtained in a high percentage of cases both by operation and irradiation. The cosmetic result of irradiation is better than that of surgery. In an increasing number of cases a permanent cure is obtained with irradiation at a single sitting. In cases of more markedly proliferating tumors it is obtained by repeated irradiation without injury to the cosmetic result. The same result may be obtained by simple irradiation also in infiltrating cancers of the skin which involve the periosteum or perichondrium only slightly but in cases with complete infiltration of the periosteum and perichondrium and involvement of bone or cartilage electrocoagulation is indicated and irradiation should be employed only for recurrences. In all of these cases the Braun method of grafting is preferable for skin covering to the transplantation of a skin flap as a recurrence may easily spread under the latter before it is detected.

The squamous epithelial carcinoma, in itself, has a so more unfavorable prognosis than the basal-cell carcinoma, but exhibits a tendency to form regional glandular metastases. Recent metastases of this type can be made to disappear with irradiation, but in those which are older small firm nodules remain. For lesions which are not adherent, operative removal and irradiation are to be recommended. In cases of penetrating carcinoma and lupus carcinoma a single irradiation with weak filtration may be tried otherwise electrocoagulation is indicated. In more extensive destructions, extensive electrocoagulation, irradiation of recurrences, and prosthetic replacement come up for consideration according to the site of the lesion. In cases that are to be irradiated biopsy is desirable as the prognosis and also the method of irradiation depend upon the histological character of the tumor. In carcinoma of the scalp forehead, and temporal region weakly filtered irradiation is indicated if the underlying bone is still uninvolved. Irradiation is to be preferred also for skin cancers of the eyelids and their surroundings, but care must be taken to protect the eyes. In none of the cases reviewed did a plastic operation give a permanent cure.

Irradiation is preferable also in carcinoma of the nasal region and gives good results in this condition. Better results are obtained in carcinoma in the region of the cheeks than in carcinoma in the region of the eyes and ears. In the cases reviewed, the incidence of failure to cure was highest in those of squamous epithelial cancer. Most of the carcinomas in the region of the ears were of this type. For such lesions irradiation is to be considered for the avoidance of disfigurement. In carcinoma of the trunk (squamous epithelial type) operation should usually be performed, but postoperative irradiation should always be given. Carcinoma of the extremities should be irradiated. If the tumor has already attacked the bone, amputation is often necessary. Amputation must be done frequently also for lupus carcinoma of the extremities. When the lesion

occurs on the face, a cure is often obtained by irradiation in intensive dosage with weak filtration combined with electrocoagulation.

Of the 904 women treated for carcinoma of the breast from five to sixteen years ago, 863 (95.46 per cent) were followed up. Of the latter 390 (32.4 per cent) have survived for five years or more. Of the 610 women who were treated ten or more years ago, 573 (93.77 per cent) were followed up. One hundred and thirteen (18.52 per cent) are still living after ten or more years.

The results of the various methods of treatment after five or more years are as follows:

Of 367 women subjected to radical operation, 185 (50.4 per cent) have survived five or more years. Of these, 121 (32.9 per cent) had a single operation. Of 239 who were irradiated for recurrences (including 15 with distant metastases) 75 (31.4 per cent) have survived for five years or more, whereas of 183 who had prophylactic irradiations, 97 (53.0 per cent) are still alive, and of 63 with an inoperable lesion who were treated only by irradiation, 4 (6.3 per cent) are still alive.

Of 1,074 patients operated upon radically in the period from 1913 to 1930, 33 (3.6 per cent) died within the first four weeks after the operation.

The radical operation of Hildebrandt and Roter gave the best results. According to the combined statistics on 4,033 cases from 20 clinics, German and foreign, the incidence of five-year cure was 23.4 per cent and in 4 institutions the incidence of cure for ten or more years was 17.3 per cent. Operations for recurrences may also be successful. However, in cases of recurrence irradiation has a wider field of application, doubles the duration of life, and in a considerable number of cases has resulted in permanent cures. Involvement of the other breast appearing after one or several years in the form of a primary disease operation should be considered as its permanent results are favorable.

In cases of distant metastases irradiation is only palliative.

For the evaluation of prophylactic irradiation the author cites the combined statistics of 21 clinics, German and foreign, covering 2,831 cases. These show the incidence of five-year cure to be 37.9 per cent as compared with 23.4 per cent in unoperated cases. In his own cases the author has obtained a five-year cure in 53 per cent and a ten-year cure in 30.3 per cent as compared with 17.3 per cent in cases without prophylactic irradiation. In the period from 1921 to 1925 a five-year survival was obtained in 60.8 per cent of the cases with the use of powerful irradiation apparatus and the tangential method. Of 100 women subjected to amputation of the breast without postoperative irradiation, 70 died within five years, whereas of 100 who received prophylactic irradiation, only 47 died within five years.

In the prognosis, the stage of the disease at which the patient comes for treatment is of chief importance in spite of all improvements in the technique of treatment. The treatment described was most

effective in stages 2a and 2b, but prophylactic irradiation is advisable also in Stage 1

With regard to the histological structure of the tumor, the author states that prophylactic irradiation should not be omitted even in cases of benign colloid cancer. In cases of adenocarcinoma it gives a more favorable result than in cases of medullary cancer (a five-year cure in 43.4 per cent of the former as compared with 30.5 per cent in the latter). In carcinoma simplex the incidence of cure is very similar. One-third of all of the cases reviewed were cases of scirrhous carcinoma. Of these, a five-year cure was obtained in only 26.7 per cent, and after postoperative irradiation in only 37 per cent. The results in Paget's disease were not unfavorable when the patients came for treatment while they were still in the operable stage. Attention is called to the fact that a number of patients who were operated upon for supposed carcinoma, but whose tumor was considered benign on the basis of the findings of histological examination, subsequently died from carcinoma. Therefore even lesions that appear only clinically to be carcinomata should be given prophylactic secondary irradiation. Even in inoperable

cases a considerable prolongation of life was obtained by irradiation.

In the discussion of this report KOENIG stated that he had attempted to obtain statistics on patients with carcinoma of the breast who were living in the Wuerzburg region. Four hundred and fifty-nine have survived five years. Of the 102 who were operated upon in the clinic, 72 are still living. Koenig believes that the best results are obtained by surgeons who always operate according to definite method. He stated that this is true also in carcinoma of the rectum. The surgeon who is more accustomed to the abdominosacral operation will obtain the best results with that procedure, whereas the surgeon who is accustomed to the sacral method will obtain the best results with the latter. Poor results will be obtained by those who do such operations only occasionally. Nevertheless the reports show that there are thousands of patients living who were operated upon for carcinoma from five to twenty years ago. However, we can arrive at our goal only when definite regulations are established as to the manner in which the patients with carcinoma should be operated upon.

STETTNER (Z)

## MISCELLANEOUS

### CLINICAL ENTITIES—GENERAL PHYSIOLOGICAL CONDITIONS

Downie, E.: Diabetic Gangrene. *Australia & New Zealand J Surg* 43: 1, 1913.

While the use of insulin has prolonged life in diabetes, modern experience has demonstrated an increase in the vascular changes associated with the condition. Arteriosclerosis resulting in gangrene is a frequent complication. This is usually limited to the arterioles of the arteries and consists of occlusion of the lumen with invasion of the intima by adventitious vessels. Thrombosis with canalization and the development of a collateral circulation has been noted in many autopsy specimens. A chronic inflammatory process in the vessel wall involving the muscular as well as the intimal coat has also been observed. The author shows the different stages of arterial disease by photomicrographs.

Of the factors predisposing to the development of diabetic gangrene, vascular changes are most important. Lowered resistance of the tissues to infection and trauma may allow gangrene to develop from an apparently trivial injury. Many methods, including the Matis and Moskowicz procedures and the use of the Pichon occlusometer are of aid in determining the degree of impairment in the vessels. While they are not completely adequate, they are of value in selected cases.

The development of gangrene may be preceded by pain or numbness and a sensation of burning in the extremities. These may bear a definite relationship to exercise. As the arterial changes are gradual, the symptoms are not of sudden onset. With the development of gangrene the pain becomes constant and severe. In the presence of infection there are symptoms of toxemia and sepsis. The area of infection may extend some distance from the gangrenous area.

Patients with arterial changes should be impressed with the importance of proper footwear and care of the feet. The diabetic state should be controlled by diet and insulin. An area of dry gangrene should be protected with antiseptic dressings and treated with heat. Heat is best applied by means of an incandescent bulb. The indications for amputation are: (1) spreading gangrene unaffected by any form of treatment, (2) septicemia, (3) failure of response to diet and insulin due to the presence of severe infection, and (4) persistent and intractable pain. The site of amputation must be carefully selected and the patient prepared properly for the operation in order to prevent shock and acidosis. The operation is best performed under spinal anesthesia unless this is contra-indicated. The use of the tourniquet has been abandoned. Speed with minimal trauma

to the tissues is important. Adequate steps with anesthesia must be provided. After the operation the diabetic state must be controlled by the administration of insulin in quantities almost sufficient to produce hypoglycemia. WILLIAM J. PACCOT, M.D.

Rogier, H.: The Neurological Complications of Debilant Fever (La neuroinfébrilité). *Presse méd* Par 1894, xl, 735.

This article is a record of an experience of several years with the nervous manifestations of debilant fever.

The early cerebral symptoms differ little from those occurring in typhoid and other infectious diseases. A delirium with excitation soon gives place to torpor. More interesting are the late symptoms. In one case mutism and negativism developed several months after the fever. The patient recovered, but died of tuberculosis. Another patient presented the syndrome of dementia praecox three months after the attack of fever but eventually was cured completely.

In addition to psychic disorders there may be sensory and motor disturbances. In rare cases the disease may evolve as an acute encephalitis with headache, delirium, myoclonia, and diplopia and cause death within a few days. Sometimes it is associated with convulsions or hemiplegia. More common and characteristic are late cerebral sequelae. These may be minor or may assume the character of a grave encephalitis.

Vascular spasms are rather common and cause the classical symptoms of migraine, including all of the ocular and peripheral phenomena.

The authors have observed two cases with the cerebelloposterior syndrome. One of the patients recovered. In the other the condition progressed for a while and then remained stationary.

Spinal involvement is of three clinical types. As essential form is a flaccid paralysis which is progressive and fatal. More common is a spastic paraplegia with anesthesia or hyposthesia. The course of the condition is variable. It may develop slowly or rapidly and may regress or persist. It then goes no further than slight pyramidal symptoms and signs.

Quite characteristic of debilant fever is the syndrome of meningoradiculoneuritis. The symptoms consist of a flaccid paralysis with abolition of the tendon reflexes and slight muscular atrophy. There is no spinal rigidity or Kernig sign, but the cerebrospinal fluid reveals an intense meningeal reaction (xanthochromia, a large amount of albumin, from 50 to 100 cells). Occasionally an intermittently positive Babinski sign indicates some degree of cord involvement.

During the acute phase of the disease meningeal symptoms are common. They are usually evanescent, but a basilar meningitis may occur as a terminal event.

A true meningitis producing all of the classical clinical and biological signs usually appears toward the end of the fever, but in some cases may not develop until as long as seven months after apparent cure. The course is slow, and except for the favorable outcome, closely resembles that of tuberculous meningitis.

In conclusion the author states that transitions from one type of nervous involvement to another are common, a fact rendering the prognosis uncertain. He believes that, with its dissemination, undulant fever is undergoing changes in its character. This view is supported by Nicolle who says, "Undulant fever is in a process of evolution and is showing a tendency to become chronic. In the future, through its manifestations and chronicity, it will become one of the most frequent and tenacious of diseases."

ALBERT F. DE GROAT, M.D.

Kilbourne, N. J. Leg Ulcers of Unrecognized Etiology. *J Am M Ass*, 1932, xcvm, 1955.

Kilbourne states that leg ulcers without an obvious cause are a neglected diagnostic problem. Many treatments tried have resulted in only temporary improvement or none at all. The causes of the lesions in 150 cases reviewed by the author are shown in the following table.

Causes	Cases diagnosed	Diagnosis established
Circulatory diseases		
Lacunar ulcers	7	6
Ordinary varicose ulcers	92	92
Arteriosclerotic ulcers	3	2
Senile	7	7
Syphilitic	2	2
Lymphangitic ulcers	3	2
Thrombo-angitis obliterans	1	0
Metabolic diseases		
Endocrine ulcers		
Hypothyroidism	2	1
Hypo-insulinism (contributory)	11	10
Hypopituitarism	0	0
Anemia ulcers		
Primary anemias		
Sickle cell anemia	1	1
Perniciosa anemia (also blastomycosis)	1	1
Secondary anemias	6	5
Glutony ulcers	3	1
Malnutrition ulcers	1	1
Infections		
Wassermann negative ulcers	8	7
Wassermann positive syphilis	11	9
Tuberculosis (Bazin's erythema induratum)	1	0
Mycotic ulcers		
Blastomycosis	2	2
Drugs		
Iodemia	1	1

#### Neurotrophic disturbances

Hyperæsthetic ulcer—irritable ulcer	1	1
Anæsthetic ulcer—tabes dorsalis	1	1
Carcinoma		
Basal-cell	2	2

The lacunar ulcer has been found to be due to invisible varicose veins which are too deep in the tissues for palpation but may be demonstrated with the X-ray after the intravenous injection of a radio-opaque substance such as uroselectan. The author warns against the use of iodized poppy-seed oil as in experiments on dogs in which this substance was injected into the veins by Ratschow death resulted from pneumonia due to fat emboli.

Kilbourne discusses in some detail ulcers due to arteriosclerosis, endocrine deficiency such as hypothyroidism and hypo-insulinism, anemia, obesity, malnutrition, tuberculosis, drugs, malignancy, and neurotrophic disturbances. He distinguishes 2 types of neurotrophic ulcers, the anæsthetic and the hyperæsthetic.

He states that the diagnosis of syphilitic ulcer may be extremely difficult. In clinically doubtful cases in which the Wassermann reaction is negative a therapeutic test with bismuth or iodides should be given.

WILLARD K. KISER, M.D.

#### GENERAL BACTERIAL, PROTOZOAN, AND PARASITIC INFECTIONS

Rieder, W. Postanginal Sepsis and Its Treatment from the Standpoint of the Surgeon. An Experimental and Clinical Study (Postanginoese Sepsis und ihre Behandlung vom Standpunkt des Chirurgen. Eine experimentelle und klinische Studie). *Arch f klin Chir*, 1931, clxviii, 1.

Rieder believes that the focus of sepsis may be situated in veins which are thrombosed in or near the pharyngeal tonsil. To prove that the walls of veins may become infected from a gland he cites the histological findings in a case in which such infection occurred.

In his experimental work he injected a bacterial emulsion into the vascular sheaths in the necks of thirty-seven dogs and rabbits. Subsequently the bacteria were found to have entered the lumen of the vein through the venous wall and in a few cases they had entered the thrombus in the lumen. This occurred even when the jugular vein had not been ligated. In twenty-two animals in which the jugular vein was ligated at the time the injection was made thrombosis resulted only five times and only when changes occurred in the vascular wall. In the animals without thrombosis bacterial invasion of the vascular lumen could not be demonstrated even by cultural methods.

In the diagnosis the anamnesis is of chief importance. The disease-picture is so little known in medical circles that the only effectual treatment, surgery, is often not given at all or not at the proper time. Chills are not necessarily an indication for operation, but a continued high temperature usually



indicates intervention. The discrepancy between the local tonsillar involvement and the severity of the general symptoms suggests the nature of the condition. The hardened cords in the neck and the pains about the angle of the mandible are also of aid in the diagnosis.

The prognosis is poorest in anaerobic infections. In such infections pulmonary metastases occur. The value of ligation of the veins as a therapeutic measure is still doubtful. In an experiment on a dog the author found that ligation in the tonsillar region of one of the internal jugular veins, and several hours later of the other, did not check the dissemination of the bacteria in the blood.

In studying venous ligation, the author injected the veins and then dissected the necks of thirty-four fresh cadavers. He thus obtained valuable data concerning the numerous anatomical variations. A number of these are shown by illustrations. Among them were anastomoses with the pharyngeal plexus, the vena vertebralis, the vena facialis externa, and the cranial branches of the vena facialis posterior.

Rieder concludes from his findings that all of the possible routes of infection within the area of venous

drainage must be kept in mind. He describes in detail (partly with pictures) the methods which he uses to expose these less studied areas. One picture shows lymph vessels injected from the tonsillar region which connected with the lymph nodes directly or indirectly behind the digastric and stylohyoid muscles. The author's method of procedure depends upon the conditions found in the individual case. The steps in his operative procedure include ligation of the vena jugularis or vena faciales, excision of the tonsil combined with venous ligation, and interruption of continuity of the vena tonsillaris with removal of thrombus up to the healthy tissues. When the lymph glands are involved they are extirpated by opening up the parapharyngeal space. Rieder operates under local anesthesia or avertin narcosis.

He cites a case of severe postanginal pyemia in a child of four and a half years in whom venous ligation ended the chills, but the febrile condition was not controlled until the joint metastases had been incised and irrigated and one eyeball which had become involved in panophthalmitis had been enucleated.

KLEINHAU (III).

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NOTE—THE BOLD FACE FIGURES IN BRACKETS AT THE RIGHT OF A REFERENCE INDICATE THE PAGE OF THIS ISSUE ON WHICH AN ABSTRACT OF THE ARTICLE REFERRED TO MAY BE FOUND

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## SURGERY OF THE BONES JOINTS MUSCLES TENDONS

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# INTERNATIONAL ABSTRACT OF SURGERY

NOVEMBER, 1932

## ABSTRACTS OF CURRENT LITERATURE SURGERY OF THE HEAD AND NECK

### HEAD

Wilensky, A. O. The Association of Osteomyelitis of the Skull and Nasal Accessory Sinus Disease  
*Arch Otolaryngol*, 1932, **xv**, 805

The author presents a review of the association of osteomyelitis of the skull and nasal accessory sinus disease, including the etiology, pathology, symptoms, clinical course of typical cases, prognosis treatment, and mortality. The clinical picture presented by the majority of the cases is very similar. The infection that leads to the fatal result usually occurs within two or three days after an operation for disease of the nasal accessory sinuses. The diploë of the frontal bone is invaded by the organisms and osteomyelitis is set up. The infection spreads thence through the outer table, giving rise to subperiosteal abscesses beneath the scalp. It may also spread inward and may subsequently give rise to extradural or subdural abscess, general meningitis, cerebral abscess, or thrombosis of the longitudinal or other large sinuses. The dura mater is affected in practically all cases, and the pachymeningitis may remain localized a long time. Thrombosis occurs chiefly in the lateral or longitudinal sinuses. The invasion of a large venous sinus is often manifested by emboli with distant metastases. Pneumonia or bronchopneumonia frequently occurs.

It is generally easy to make a diagnosis of osteomyelitis in the bones near the orbit or ear. However, it is often difficult to recognize the diffuse form because the general symptoms are often more pronounced and may mask the local symptoms. A diagnosis may be made before operation if the symptoms that accompany the sinusitis or mastoiditis are carefully studied. When the osteomyelitis becomes evident, operation is necessary and should be as extensive as possible. The cranial bones should be resected beyond the limits of the lesion. If the wound continues to granulate and if the temperature remains high, sequestra are present and must be removed as completely as possible. The

mortality is high. After a varying length of time ranging from weeks to years, the patient succumbs to one or more of these conditions with or without the manifestations of a general blood infection.

MANUEL E. LICHTENSTEIN, M.D.

Bull Engelstad, R. Radium Treatment of Actinomycosis of the Face and Neck (Radiumbehandling von Gesichts- und Hals-Actinomycose) *Norsk Mag f Lægevidensk*, 1932, **xviii**, 161

Since Heyerdahl reported the cure of twenty-one cases of cervicofacial actinomycosis by radium irradiation in 1927, twenty-eight additional cases have been treated with radium at the Imperial Hospital at Oslo. Twenty-five of the twenty-eight patients were completely cured, one died of meningitis due to the staphylococcus albus, and one is still under treatment. One patient has not reported, but when last heard from was practically cured. The cosmetic results were very good. The usual dosage was from 33 to 55 mgm of radium-element used with a 2-mm lead filter for forty-eight hours. The number of treatments varied. Preliminary incisions seemed to delay the cure.

R. BULL ENGELSTAD (H)

### EYE

Guazzieri, G. The Pathogenesis and Treatment of Traumatic Pulsating Exophthalmos (Sulla patogenesi e la cura dell'esoftalmo pulsante traumatico) *Ann Ital di chir*, 1932, **xi**, 429

The author reports two cases of traumatic pulsating exophthalmos resulting from bullet wounds in which the bullet entered close to the ear and became lodged at a point external to the base of the skull, in the region between the sphenoid bone and the basilar process of the occipital bone. The exophthalmos developed three and eight weeks respectively after the injury. Head noises described as resembling the beating of a hammer or a blowing murmur preceded the development of the eye changes. In both cases a diagnosis of arteriovenous aneurism

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MANUEL E. LICHTENSTEIN, M.D.

Bull Engelstad, R. Radium Treatment of Actinomycosis of the Face and Neck (Radumbehandling von Gesichts- und Hals-Actinomycose) *Norsk Mag f Lægevidensk*, 1932, **xciv**, 161

Since Heyerdahl reported the cure of twenty-one cases of cervicofacial actinomycosis by radium irradiation in 1927, twenty-eight additional cases have been treated with radium at the Imperial Hospital at Oslo. Twenty-five of the twenty-eight patients were completely cured, one died of meningitis due to the staphylococcus albus, and one is still under treatment. One patient has not reported, but when last heard from was practically cured. The cosmetic results were very good. The usual dosage was from 33 to 35 mgm of radium-element used with a 2-mm lead filter for forty-eight hours. The number of treatments varied. Preliminary incisions seemed to delay the cure.

R. BULL ENGELSTAD (H)

### EYE

Guazzieri, G. The Pathogenesis and Treatment of Traumatic Pulsating Exophthalmos (Sulla patogenesi e la cura dell'esoftalmo pulsante traumatico) *Ann ital di chir*, 1932, **xi**, 429

The author reports two cases of traumatic pulsating exophthalmos resulting from bullet wounds in which the bullet entered close to the ear and became lodged at a point external to the base of the skull, in the region between the sphenoid bone and the basilar process of the occipital bone. The exophthalmos developed three and eight weeks respectively after the injury. Head noises described as resembling the beating of a hammer or a blowing murmur preceded the development of the eye changes. In both cases a diagnosis of arteriovenous aneurism



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became blind in one eye and 29.5 per cent became blind in both eyes, and as the result of intrinsic eye disease, 23.9 per cent became blind in one eye and 47.1 per cent became blind in both eyes.

The anatomical causes of the blindness are shown in the following table:

	Both eyes		One eye	
	No.	%	No.	%
Absence of the eyes	165	7.9	8	1.2
Atrophy of the eyeball	488	23.5	48	7.3
Corneal changes	466	22.5	138	21.0
Glaucoma and buphthalmia	383	18.4	123	18.7
Diseases of the choroid and retina	216	10.4	54	8.2
Diseases of the optic nerve	196	9.4	244	37.1
Detachment of the retina	56	2.7	10	1.5
Intra-ocular growths	30	1.4	2	0.3
Other diseases of the eye	77	3.7	31	4.7

The pathological causes of the blindness were as follows:

	No.	%
Congenital blindness	14	3.2
Gonorrhea	36	8.5
Smallpox	23	5.4
Infectious diseases of childhood	13	3.0
Trauma	52	12.3
Trachoma	17	4.0
Glaucoma	117	28.1
Syphilis	53	12.3
Myopia	3	0.7
Malignant tumors	3	0.7
Diseases of the central nervous system	35	8.4
Sympathetic ophthalmia	11	2.6
General and other affections	46	10.2

Trauma was the cause of blindness in 15.7 per cent of the males and 7.9 per cent of the females, glaucoma, in 22.5 per cent of the males and 37.4 per cent of the females, and syphilis, in 19.7 per cent of the males and 2.4 per cent of the females.

In farmers, blindness in one eye was caused by trauma in 45.9 per cent, by glaucoma in 20.9 per cent, by trachoma in 8.7 per cent, and by syphilis in 4.1 per cent, in laborers, by trauma in 48.3 per cent, by glaucoma in 18.4 per cent, by trachoma in 3.2 per cent, and by syphilis in 8.9 per cent. In farmers, blindness in both eyes was caused by trauma in 14.1 per cent, by glaucoma in 35.2 per cent, by trachoma in 8.4 per cent, and by syphilis in 9.9 per cent, and in laborers, by trauma in 18.9 per cent, by glaucoma in 23 per cent, by trachoma in 4.6 per cent, and by syphilis in 31 per cent.

KURIES (O)

Blair, V. P., Brown, J. B., and Hamm, W. G.  
The Correction of Ptosis and of Epicanthus  
*Arch. Ophth.*, 1932, vii, 831

In the absence of action of the levator palpebrae muscle, direct fixation of the tarsus of the upper lid to the occipitofrontalis muscle best elevates the lid. Of the plans proposed for such fixation, the authors believe the most satisfactory is the use of thin strips of fascia lata. The technique is as follows:

After adequate exposure of the fibrotic band and the removal of all fat, thin strips are cut in the direction of the vertical fibers. The strip is fixed into

the eye of a moderately slender surgical needle 5 cm long by pushing one end of the fascia through the eye and fastening it with several transfixing and encircling stitches of fine silk.

A transverse skin incision 1 cm long is made completely through the skin above the brow, and two transverse skin stabs are made about 1 cm apart just above the tarsal border. The carrier needle is inserted at the outer end of the horizontal cut and after it has traversed the brow and lid subcutaneously is brought out through the corresponding stab. It is then inserted in the same stab wound to engage the upper border of the tarsus and emerge at the other stab wound, where it is again inserted to traverse the lid and brow subcutaneously and emerge at the inner end of the horizontal cut. The strand ends are then tied in a single knot, which is tightened until the desired elevation of the lid is obtained. The knot is fixed by several sutures of fine silk, and each end of the fascia is buried under the skin. The incisions are closed with interrupted sutures, and a light pressure dressing is applied for from twenty-four to forty-eight hours. At the end of that time all dressings are removed.

At the beginning of the elevation of the lid the directions of pull of the levator palpebrae and occipitofrontalis muscles rather closely coincide, but if the elevation by the latter is carried high enough the tarsus may be drawn away from the globe.

The tendency of the patient to draw up the eyebrows and to develop a strained expression in the effort to open the paralyzed lid or lids is usually relieved by the operation.

Ptosis may be part of a congenital deformity of the lids which may be associated with epicanthus.

Epicanthus is due to an apparent congenital or acquired vertical shortness of the involved tissues which produces a more apparent than real redundancy in the transverse direction. It may be emphasized by a natural or acquired flatness of the nasal bridge. In the congenital type correction can usually be obtained by flap switching which adds vertical length at the expense of the transverse redundancy. In the traumatic type it may be necessary to use a skin graft or switch a flap from a distant site. In some cases elevation of a flat nasal bridge will help.

Key, B. W. Extensive Iridodialysis Operation, Re-Attachment. A Report of Two Cases. *Arch. Ophth.*, 1932, vii, 748

Iridodialysis following injury without loss of the globe results in deformity and visual disturbance. In the less marked cases neither may be noticed and both may be corrected by the judicious use of atropin immediately after the injury. For cases which do not respond to this treatment, Key proposes the following surgical procedure:

A keratome incision is made directly at the site of the iridodialysis to form a flap consisting of conjunctiva and a bit of sclera. The iris is then

between the internal carotid artery and the cavernous sinus was made and ligation of the common carotid artery and the internal jugular vein was done. After the ligation the pulsations of the protruding eye and the head noises ceased immediately. The patients suffered no mental changes following the double ligation.

As the bullet did not enter the cranial cavity in either case, the author believes the etiological factor was an indirect injury to the internal carotid artery with delayed development of the arteriovenous communication. In the first case no fracture was demonstrated, but the author believes there was fissuring of the sphenoid not demonstrated roentgenographically. Such fissuring might lead to injury of the wall of the internal carotid artery. In the second case a basal fracture near the sella turcica was demonstrated.

The author discusses the proposed methods of treatment. He attributes the excellent results in his cases to the simultaneous ligation of the artery and vein.

PERCE A. ROSE, M.D.

Di Mersio, O., and Salvatori, G. B. Results of Roentgen Therapy in Some Diseases of the Eye (Resulti del Roentgenoterapia bei einigen Augenaffektionen). *Strahlentherapie*, 1933 2:24, 56.

The results of roentgen treatment in 300 cases of eye diseases are reviewed. The conditions included inflammations, neoplasms, and a variety of other lesions.

In the group of inflammatory conditions, xerotic processes of the cornea were most numerous and yielded the greatest number of good results. Of 109 cases, the condition was cured in 83, improved in 17, and not improved in 9. These were cases of epithelial and acanthous ulcer, filamentous keratitis, burns, rodent ulcer (3 cases, in which the lesion healed well) and 16 cases of hypopyon keratitis. It was found that in this condition irradiation of one eye had a favorable effect also on the other eye, even when the disease had been present for as long as a year. Also in paronychia keratitis—which was usually of luetic origin—irradiation exerted a favorable influence even when it was not supplemented by any other form of treatment.

Of special interest were experiences with secondary irradiation, which was employed in diseases of the palpebral conjunctiva. In trachoma, marked improvement usually occurred, but complete cure was relatively infrequent and was obtained as a rule only after preliminary expression. As in other conditions, irradiation alone proved inferior to irradiation combined with mechanical treatment. Recurrence was not uncommon. Of the cases of pinnia, a cure was obtained in 4, improvement in 11 and improvement followed by recurrence in 3. Vernal conjunctivitis was not influenced by irradiation of the lids nor of the conjunctiva; progressive improvement was obtained.

The number of failures of irradiation treatment was greatest in the group of cases of miscellaneous

pathological conditions. The results in pterygia and the cicatricial formations following operations for pterygium could be considered good, but detachment of the retina, degeneration of the cornea, and hemorrhage into the vitreous in cases of thrombopenia usually proved refractory.

In the group of cases of tumor, 3 epithelial carcinomas were cured and have not recurred in a period of six years. A papilloma of the conjunctiva was also cured. In a case of sarcoma no effect was noted. Of the cases of retinal glioma, 5 of which were bilateral, the result in 3 may perhaps be regarded as good. One patient has now remained free from recurrence for six years. The better eye was saved, but the other one became atrophied. In a case of intra-ocular sarcoma and a case of orbital sarcoma the treatment was without effect.

In discussing the technique of the irradiation, the authors state that in general they prefer hard rays. They have employed hard rays even for secondary irradiations, in which as a rule filters of varying hardness are used. They employ symmetry apparatus, metro tubes, a parallel spark gap of 40 cm. 1.5 mm., a filter of 0.5 mm. of steel and 2 mm. of aluminum, a skin-focus distance of 33, 45, 57 or 70 cm. and, in deep therapy, as much as from 50 to 70 cm. In the treatment of inflammations, from 10 to 40 per cent and occasionally even 50 per cent, of the skin-erythema dose is given and is sometimes repeated up to 100 per cent. The skin-erythema dosage is 3,500 French roentgens (Solomon). Neoplasms are given from 150 to 300 per cent of the skin-erythema dose in several sittings.

BORRERO (C)

Smell-Jen, L. I. Blindness According to the Material of the Eye Clinic in Odessa (Blindheit nach Materialen der Augenklinik in Odessa). *Zeitschr. f. Augenheilk.* 1933 27: 230.

This article is based on cases of blindness found among 4,113 cases of eye disease treated in the Odessa ophthalmological clinic. The patients made their first visit to the dispensary in the period from 1903 to 1931. Six hundred and sixty-eight were blind in both eyes and 2,072 were blind in only one eye. Of the total number of those who were blind, 50.8 per cent were natives of Odessa and 49.2 per cent were males. As the 1920 census for the Odessa region shows only 97 men to each 100 women, there are 1.6 times as many blind men as blind women.

The incidence of blindness was lowest (4.1 per cent) in the age period from eleven to fifteen years, and highest (14.0 per cent) in the age period from forty-one to fifty years. A table giving the time of life at which sight was lost shows that 3.1 per cent of the patients were blind from birth, 30.7 per cent became blind before the fifth year of age, and 31.7 per cent became blind in one eye and 32.3 per cent became blind in both eyes before the fifteenth year of age. Therefore in one-third of the cases the blindness dated from childhood. As the result of disease extrinsic to the eye 33.9 per cent of the patients

secondary to infection of the pial vessels. In the first type surgical cure is possible as long as the infection is limited to a basal cistern. In the second type the condition is uniformly fatal, at least when it has advanced beyond the neighborhood of the primary focus.

Pneumococcus Type III meningitis secondary to infection of the pial vessels is generally of sphenoidal origin. In this condition a favorable outcome requires an early attack on the sphenoid, and the type of operation will depend upon whether the invading organism enters from a thrombophlebitis of the submucosa or an osteomyelitis of the sphenoidal basis.

Meningitis due to the streptococcus hæmolyticus is the result of a localized collection of pus in the mastoid, a venous sinus, an adjacent air space, or the medullary substance of the sphenoid basis or of the petrous apex. Encephalitis is an early and frequent complication of meningitis developing as a sequela to infection of a pial vessel.

GEORGE R. McAULIFF, M.D.

### NOSE AND SINUSES

Bompet, R. The Development of the Frontal Sinuses in the Child and Its Surgical Significance (Desarrollo de los senos frontales en el niño y sus aplicaciones quirúrgicas) *Rev. méd. Lat.-Am.*, 1932, xvi, 613.

In children, affections of the paranasal sinuses present characteristics which are fundamentally different from those presented in adults. Frontal sinusitis requires special consideration because of its frequency and gravity in the child. In adults, the frontal sinus is affected less frequently than the maxillary sinus because of its special anatomical and physiological characteristics. In children, the difference in the frequency of involvement of these sinuses is still greater because of the late appearance and slow development of the frontal sinus.

The author has made a very detailed study of the embryology and anatomy of the paranasal sinuses, with special attention to the development of the frontal sinus in childhood. The literature shows a difference of opinion as to the time of appearance of the frontal sinus. In 1869, Dursy claimed to have discovered a small frontal sinus in a fetus of 10¾ cm. Kilian found a frontal sinus in a baby fifteen months old and in two children of six and seven years respectively. Other authorities maintain that the development of the frontal sinus is not complete until puberty.

Because of this diversity of opinion the author made an extended study of roentgenograms of the frontal sinuses in children between the ages of six months and eighteen years. He concludes that the frontal sinus appears between the sixth and eighth years of age. This fact is of great clinical and therapeutic importance because it interdicts the diagnosis of frontal sinusitis before the age of six years.

The author summarizes the symptoms, diagnosis, and treatment of frontal sinusitis in children and includes in his article a number of roentgenograms of the frontal sinuses at different ages of childhood.

WILLIAM R. MEEKER, M.D.

Van der Hoeven Leonhard, J. The Anatomical Basis of Chronic Frontal Sinusitis. *J. Laryngol. & Otol.*, 1932, xlii, 369.

The author studied 212 frontal sinuses to determine the differences between acute inflammations of those sinuses which clear up under local treatment and those which go on to a chronic state.

He found that most frontal sinuses with a transverse diameter up to 30 cm. were free from anatomical factors which would mechanically prevent spontaneous healing, whereas most of those with a transverse diameter of more than 30 cm. contained shallow ridges, pockets, lateral recesses formed by vertical ridges, and septa which impeded drainage and hence would interfere with spontaneous healing. His findings therefore indicate that the prognosis of acute frontal sinusitis may be aided by determining the transverse diameter of the sinus from the roentgenogram and thereby determining the probable presence or absence of factors interfering with drainage.

JAMES T. MILLS, M.D.

### PHARYNX

Skoog, T. Spontaneous Hæmorrhage from the Tonsillar Region (Ueber Spontanblutungen aus den Tonsillengebieten). *Arch. f. Ohren-, Nasen- u. Kehlkopfch.*, 1932, cxxx, 206.

Spontaneous hæmorrhages from the tonsils or tonsillar area are divided into three groups. The first and most important group are those occurring in peritonsillar or other inflammatory processes arising in the tonsils. The second are those caused by ulcerous changes in the tonsil. The third are hæmorrhages the cause of which is to be found, not in the tonsil, but in some general condition such as hæmophilia, hypertonia, kidney disease or vicarious menstruation.

In discussing the first group, the author cites the statistics of von Lebram (twenty-five cases), Luebbers (fourteen cases), Stumpf (fourteen cases) and Serer (sixteen cases), and presents a new collection, including thirteen cases from the literature and three cases of his own. The hæmorrhage occurs most frequently in cases of tonsillitis or peritonsillitis with a protracted course or with marked swelling of the glands about the angle of the jaw. It is less frequent in anginas of short duration. The angina of scarlet fever seems particularly dangerous. The source of the bleeding is usually an artery, seldom a vein. The bleeding occurs considerably oftener in the form of a spontaneous hæmorrhage or following the rupture of an abscess than after an incision.

In accord with Luebbers, Skoog rejects the view of Lebram that ligation of the common carotid is the only method to be considered for septic hæmor-

withdrawn and a No. 000 French silk suture is passed through it and the scleroconjunctival flap, the latter being in turn sutured in place.

Key emphasizes the importance of performing the operation gently and passing the suture through the margin of the iris.

Vernon Winscott M.D.

Heldert: High Blood Pressure and the Fundus Oculi (Hochdruck und Augenhintergrund). *Klin. Monatschr. f. A. u. G.* 93, LXXVII, 848.

In a careful study of the blood vessels in the fundus of the eye in 300 cases of high blood pressure with or without kidney disease certain vessel changes were found to accompany the different types of hypertension. During the past six months attempts to interpret the vascular picture by ophthalmoscopy with red-free light without a knowledge of the internal findings led to a correct clinical diagnosis in 50 per cent of the cases. In 10 per cent the diagnosis was not entirely correct, and in 40 per cent it was incorrect.

The author uses the Volhard classification, viz., true vascular diseases (essential hypertension and malignant sclerosis) and primary renal diseases. In essential hypertension the increase in the blood pressure is due to a passive reflex mechanism, whereas in the malignant sclerosis of acute and chronic nephritis the kidney of lead poisoning, and the kidney of pregnancy it is due to an active hematogenic toxic mechanism.

In essential hypertension the vessels are frequently distended and often show slight variations in caliber. The venules of the macula show definite tortuosity. The tortuosity is less in the medium sized veins and disappears in the larger veins. The arteries are usually of normal caliber but sometimes are slightly narrowed. They are rarely tortuous, seldom show any decrease of the lumen and never present alternate dilatation and narrowing. Compression of veins is always present at crossings. Sometimes there is a delicate peripapillary edema and more frequently displacement of pigment in the region of the macula. Severe edema is never observed. Hemorrhage is frequent but thrombosis is rare.

In malignant sclerosis the large veins are often very narrow. Dilated vessels are found only in cardiac decompensation, and distended tense veins only when there is an increase in the tension of the cerebrospinal fluid with papilledema. Even the medium-sized and small veins are frequently narrow. The macular veins are almost never so broad as in essential hypertension. The macular venules are frequently very tortuous, but the tortuosity is more angular than in essential hypertension. In young persons the tortuosity is frequently absent. The arteries are often definitely or markedly narrowed throughout their extent. The small ones are often very difficult to find even in the retina free from edema. The arteries frequently show a marked change in their caliber and sometimes obliteration. Always there is marked compression at the crossing points of vessels.

Characteristic of malignant sclerosis is the general narrowing of arteries and veins, especially of the smaller vessels. As a rule papilledema and retinal edema, new and old foci in varying numbers, and hemorrhages are present, and not infrequently there are total or partial thromboses. Postarteritic atrophy is not rare. In cases of severe papilledema changes a true contracted kidney must be suspected.

The differentiation of the vascular pictures of malignant sclerosis and chronic nephritis is difficult. The vascular changes and papilloretinal findings in both conditions may be very similar. Frequently malignant sclerosis is suggested only by marked tortuosity of the venules of the macula, but even this finding is not always present. All theories regarding the increase in the blood pressure agree that the changes occur in the smallest arteries and veins. Therefore the ophthalmoscopic findings give direct insight into the pathological process.

KRECHMER (Z).

## EAR

Gray, A. A.: Pathological Changes in the Auditory Nerve in Otosclerosis and Their Significance Clinically, Especially with Regard to Paracusis Willisii. *Proc. Roy. Soc. Med., Lond.*, 93A, 117, 1900.

In otosclerosis there is a degeneration of the fibres of the cochlear nerve beginning in the medullary sheath and neurilemma and later extending into the axile cylinder. This process occurs independently of the fixation of the stapes and of the bony changes in the capsule of the labyrinth and probably precedes both. The clinical picture is therefore produced chiefly by the nerve degeneration and only to a minor degree by the fixation of the stapes.

Tinnitus and paracusis Willisii are also due to the nerve degeneration. The nerve changes and the changes in the capsule of the labyrinth are independent of each other and both are probably called into existence by some common factor in the vasomotor system which controls the nutrition of the structures or the organ as a whole. The changes are all degenerative in character and not inflammatory. As they may occur in varying degrees in the different structures, the clinical picture of otosclerosis varies fairly widely in different cases.

GROVES R. McANULTY M.D.

Engleton, W. P.: Suppurative Meningitis of Oculic and Nasal Origin. Its Extension to Blood-Stream Invasion of the Facial Venae. *Arch. Otolaryngol.* 193, 27, 835.

During the past few years 167 persons with suppurative meningitis originating in the ear or nose were observed by the author. Of the 113 who were operated upon, 245 died and 33 per cent recovered. Autopsies were performed in 1-3 cases.

Depending on the mode of the infection and the method of its extension within the arachnoid, suppurative meningitis is of the following 2 types: (1) subarachnoid space meningitis, and (2) meningitis

## NECK

Hellwig, C. A. The Geographic Pathology of Goiter *Surg, Gynec & Obst*, 1932, 14, 35

Comparative studies of the morphology of goiter in various parts of Europe reveal a variation in the different regions. Similar studies have not been adequately made in North America. From the data available and from the author's material from Kansas, it appears that in North America the geographic variations are less pronounced than in Europe. In North America diffuse goiter is relatively more prevalent than nodular goiter, congenital parenchymatous goiter is not seen, parenchymatous nodules (fetal adenomata) are infrequent and the most common form of surgical goiter is of the diffuse and nodular colloid (macrofollicular colloid) type. Thyrotoxicosis accompanies goiter more frequently than in any other country yet studied. This is probably closely related to the high incidence of colloid goiter, which the author considers the essential organic factor predisposing to thyrotoxicosis. North American goiter resembles that found in the level portions of Europe.

Hellwig says that further geographical studies of American goiter should be made and a uniform nomenclature adopted. LEO M. ZIMMERMAN, M.D.

Hatlehol, R. On Carbohydrate Metabolism in Thyrotoxicosis and Hypothyrosis. *Acta med Scand*, 1932, LXXVII, 558

The ability to assimilate carbohydrates—estimated on the basis of blood-sugar curves after the

ingestion of 1 gm of glucose per kilogram of body weight—was determined before and after thyroidectomy in the cases of seventeen patients suffering from thyrotoxicosis and before and after treatment with thyroid gland extract in the cases of seven patients suffering from hypothyrosis.

The investigation showed that in thyrotoxicosis there may be pronounced anomalies in the carbohydrate metabolism which disappear after thyroidectomy. No parallelism with the basal metabolism or the clinical symptoms could be demonstrated.

The pathogenesis of the changes could not be determined, but is believed to be different from that of true diabetes. The fact that in some cases the carbohydrate metabolism remains entirely normal cannot be explained.

In the statistical material which is believed to prove that thyrotoxicosis predisposes to diabetes, the diagnosis of the latter condition is based on the blood-sugar findings associated with glycosuria. In the author's opinion, however, the criteria which generally serve to differentiate diabetic and non-diabetic glycosuria—i.e., the blood sugar in the fasting state and the blood-sugar curve after the ingestion of carbohydrates—do not have the same significance in thyrotoxicosis and therefore the statistical evidence is not conclusive. The same objection applies to isolated observations of cure of diabetes after thyroidectomy.

With regard to hypothyrosis the author states that his investigation did not support the theory that the carbohydrate metabolism deviates from the normal in this condition.

rhage of the throat. He believes, in fact, that this procedure should be avoided whenever possible. He states that in peritonsillaritis incision should be done as early as possible, but caution is necessary in cases with a protracted course and a marked lymphadenitis about the angle of the jaw. When erosion threatens or has begun (subcutaneous discoloration, pulsation, preceding attacks of bleeding) the carotid artery should be exposed and a ligature placed about it before an incision is made. If the patient comes for treatment when the bleeding is in progress, a tonsillectomy should be done and the bleeding vessel controlled. When the vessel cannot be located or the bleeding is severe, the carotid artery should be exposed, and if compression of the external carotid controls the hemorrhage the latter should be ligated. If the bleeding then continues the internal carotid or the common carotid should be ligated. When the bleeding has stopped at the time of operation the external carotid should be ligated and a ligature placed about the common carotid.

The author does not believe that delay of operation is indicated by the spontaneous cessation of hemorrhage due to venous erosion of the throat. He says we have no reliable criterion by which to establish the prognosis regarding recurrence of the hemorrhage, and conservative measures will sooner or later become responsible for catastrophes. Therefore, every case of hemorrhage occurring under these conditions should be treated surgically.

In discussing the second group of cases the author reports a case of spontaneous cessation of a moderate hemorrhage from an ulcer in Vincent's angina. In discussing the third group he reports a case of bleeding from a normal tonsil in the absence of general disease, which he believes may have been vicarious menstruation. ANNALS (11)

Ducuing, J., and Ducuing, L.: Malignant Tumors of the Vallecula, the Glosso-Epiglottic Fossa (Les tumeurs malignes de la vallecula, fossette glosso-epiglottique) *Bull. Soc. de chir. de Toulouse*, 933 xxxix, 303.

The vallecula or glosso-epiglottic fossa is bounded anteriorly by the base of the tongue, posteriorly by the anterior surface of the epiglottis, and to the right and left by the two lateral glosso-epiglottic folds. The median glosso-epiglottic fold separates the right vallecula from the left. In the majority of human subjects the lateral glosso-epiglottic folds are not present. In the exceptional cases in which they are present they seem to be constituted by an extension of the pharyngo-epiglottic fold. Nine times out of ten the glosso-epiglottic fossa passes imperceptibly into the glossotonsillar furrow.

The glosso-epiglottic fossa is lined by stratified pavement epithelium and contains two kinds of glands—follicular glands in the form of small lenticular proliferations, and mucous racemose glands resembling those found in the buccal cavity.

Cancer in the region of the vallecula is quite common and would be reported more frequently if it

were diagnosed earlier. In the later stages it is often mistaken for cancer of the base of the tongue. It occurs more frequently in males than in females. In females it is apparently rare. It may involve any part of the vallecula and it tends to extend to the opposite vallecula. Macroscopically most tumors of the vallecula resemble tumors found at the base of the tongue, but there seems to be one type of neoplasm characteristic especially of the vallecular region, namely the grooved type which presents as elongated ulceration parallel with the great axis of the vallecula.

Cancer of the vallecula meets with little obstruction superficially but its deep penetration is hindered by the thyrohyoid membrane anteriorly and inferiorly and by the epiglottis posteriorly. It therefore propagates toward the base of the tongue, the sub-hyo-epiglottic fatty space, or the lateral wall of the pharynx by way of the mucosal bridge between the vallecula and the wall formed by the pharyngo-epiglottic fold. Regional metastases are formed in the jugular glands. Generalization is rare. The authors state that they have seen only one case in which it occurred.

Cancer of the vallecula is seldom of the columnar cell type. As a rule it is a keratinized or non-keratinized epidermoid epithelioma. Less frequently it is an epidermoid epithelioma, and even less frequently a mixed or intermediate epithelioma.

Symptoms develop at a very early stage, much earlier than in cancer of the base of the tongue. They include the sensation of a foreign body that cannot be expelled, itching, burning, an irritating cough, bloody expectoration, and hoarseness of voice which is increased by swallowing. The origin is due to the sensory innervation of the glosso-epiglottic fossa by the superior laryngeal nerve. Visual examination and palpation of the region will reveal the tumor. Cervical adenopathy is but rarely an early sign. The glandular metastases are found at the level of the glands located below the crossing of the posterior belly of the digastric muscle by the jugular vein.

In about a third of the cases cancer of the vallecula is at first mistaken for catarrh. Syphilis, tuberculosis, and actinomycosis are very rare in the region of the vallecula, but must be borne in mind in the differential diagnosis.

The prognosis of cancer of the vallecula is very unfavorable, all patients dying of asphyxiation or hunger.

Surgical treatment is possible by the natural route or by lateral or median pharyngotomy. X-ray irradiation, radium irradiation, and electrocoagulation may be used alone or in combination. The mortality of operation is very high. Radium irradiation frequently leads to painful ulcers, bronchopneumonia, or necrosis of the thyroid and epiglottic cartilages. According to Zupplinger the best results are obtained by X-ray irradiation in fractional doses with eventual removal of local recid.

The authors report three cases. FROM S. MOORE.

facial paralysis on the right side. In 1913, following a severe fright, she began to have pain in the nape of the neck, which irradiated to the occiput and head. In February, 1914, her limbs began to feel heavy and she experienced difficulty in walking and moving her arms. In May, she began to notice atrophy of the muscles of the forearms and contracture of the extensor muscles. In July when she entered the hospital, she had paralysis of the upper and lower limbs on both sides and pain and atrophy of the muscles. The symptoms grew progressively worse and she died in June, 1916.

Autopsy disclosed forty-seven tumors ranging in size from that of a pea to that of a hazelnut on the cerebral surface of the dura mater, and a large tumor, the size of a small orange, occupying the frontal pole of the left cerebral hemisphere. All of the tumors were lobulated. There were also a number of small tumors on the inner surface of the dura mater of the spinal cord and several intramedullary tumors manifested externally only by swelling of the cord.

The histological structure of the tumors is shown by photomicrographs. The neoplasms were made up of bands of cells attached by a prolongation to the walls of the vessels. There were also plexuses made up of large numbers of newly formed nerve fibers, some of which traversed the tumor and others of which followed the vessels. In the gray substance nerve cells persisted in the midst of the tumor, some of them showing transformation into the sympathetic type of cell. The most remarkable finding was a symbiosis of the nerve fibers with the tumor cells, which had the appearance of peripheral nerve fibers undergoing neurotization. The neuroglia cells in the tumor showed enormous hypertrophy. Some of the giant astrocytes showed prolongations directed toward the walls of the vessels. In addition to the giant astrocytes there was a neuroglia reaction at the periphery of the tumor. The spinal ganglia showed rarefaction of the nerve fibers between the cells, atrophy of some of the cells, and the formation of nodules in place of the destroyed cells. In these degenerated zones the walls of the vessels were thickened. Along the roots there were fibromata made up almost exclusively of collagenous fibers, and near these fibromata there were fibers undergoing neurotization.

The second case was that of a woman forty years of age whose illness began with headache. In 1915, when the headache had become very severe and accompanied by vomiting and dizziness, a diagnosis of tumor of the cerebellum was made and the patient was given deep roentgen treatment. Her condition grew rapidly worse and she died in March, 1916. Her skin was covered with small tumors ranging in size from that of a millet seed to that of a hazelnut. These tumors were not painful spontaneously or on pressure. They had been present for fifteen years. Autopsy showed a tumor originating in the white matter of the left hemisphere of the cerebellum and extending into the gray matter. It was a grayish gelatinous mass made up of a very

rich vascular network containing many neuroglia cells in its meshes. Only a few atrophied Purkinje cells could be seen. There was also a thick mat of neuroglia fibers which was denser at the periphery than in the center of the tumor. The subarachnoid space was also invaded by the tumor, which formed a sort of diffuse glioma occupying the convolutions. The skin tumors contained an abundance of pigment and medullated and non-medullated nerve fibers.

AUDREY GOSS MORGAN, M.D.

Roussy, G., and Oberling, C.: *Histological Classification of Tumors of the Central Nervous System*. *Arch. Neurol. & Psychiat.*, 1932, XXVII, 1285.

The authors studied 251 tumors of the central nervous system in an attempt to simplify the classification for use by neurologists. They considered both the clinical and the anatomical factors involved. They recognize 5 large groups of tumors. They designate as gliomata the tumors formed by the interstitial neuroglia, as ependymochoroid tumors, the neoplasms constituted by the ependyma or the covering of the choroid plexus, and as ganglioneuromata the tumors due to the proliferation of ganglionic cells or neurons. The more embryonal type of tumors formed essentially of neuroblasts and spongioblasts they call neurospongiomata, and those reproducing the structure of nerve tissue in an earlier stage of development they classify as neuro-epitheliomata.

According to the nature of the predominant cells, the gliomata are divided into astrocytomata, oligodendrocytomata, and glioblastomata. The ependymochoroid tumors are discussed with the ependymal and choroid tumors. Ependymal tumors are classed as ependymomata. These are further subdivided into ependymocytomata, composed of cubical cells without fibrillar prolongations, ependymoblastomata, composed of ependymal cells with fibrillar prolongations, and ependymogliomata, in which there is a proliferation consisting of ependymal and astrocyte elements.

Choroid tumors are most often papillomata, but an epithelioma of the choroid was found in 3 cases.

Of the 251 tumors studied, 178 were classified as gliomata and 26 as ependymomata. The large number of ependymal tumors found was explained by the fact that a considerable number of the neoplasms studied were intraspinal. Ependymata are apparently more common in the spinal cord than in the brain.

ROBERT ZOLLINGER, M.D.

Pelper: *Compression of the Brain and Decompression in Cases of Brain Tumor* (Hirndruck und Entlastung bei Hirngeschwulsten). *56 Tag d. deutsch. Ges. f. Chir.*, Berlin, 1932.

Those taking up brain surgery will have discouraging results during the first few years, as was the case in Schmieden's clinic, but the results will gradually improve if attention is paid to certain factors such, especially, as the conditions of brain compression.



# SURGERY OF THE NERVOUS SYSTEM

## BRAIN AND ITS COVERINGS; CRANIAL NERVES

Cobb, S.: Causes of Epilepsy. *Arch. Neurol. & Psychiat.*, 1932, xxvii, 245.

Cobb has made a study of the known factors responsible for the convulsive state. His discussion deals chiefly with the causes of fits in so-called idiopathic epilepsy.

Lennox and Cobb investigated the importance of heredity by compiling statistics regarding the parents, siblings, and children of epileptic patients. They found that, in a control group, 2.6 per 1,000 suffered from epilepsy whereas in the epileptic group 21 per 1,000 cases of epilepsy occurred in near relatives. In the cases of a group of persons with traumatic head injuries who were suffering from epilepsy they found a familial history of epilepsy in 14 per 1,000. They concluded that in the general run of epileptic patients there is an inherited taint about 3 times as great as in a control group of normal persons. These findings place heredity as a predisposing factor, in a relatively unimportant place in the list of causes of epilepsy whereas formerly many authorities regarded heredity as the most important single etiological factor.

The author discusses at length the water metabolism factor cited by Fay and McQuarrie. He rejects Fay's mechanical theory of epilepsy. His own experience indicates that restriction of fluids does not lower the intracranial pressure and that excessive drinking of fluids does not raise it. He believes that the beneficial effect of dehydration is due to factors other than a change in the pressure of the cerebrospinal fluid.

He reviews the evidence that sympathetic nerve control of the vessels of the brain is of importance in the production of the epileptic fit, and discusses the influence of strong emotions, anemia, periodic changes in the nerve cells and capillaries, and alkalosis.

In conclusion he says that much research must still be done before the cause of fits can be determined.

R. CLARK SWANSON, M.D.

Ballley F.: Histological Diagnosis of Tumors of the Brain. *Arch. Neurol. & Psychiat.*, 1932, xxvii, 390.

Three large groups of tumors which vary in the age of onset, site of origin, and biological behavior occur in the brain. One group, which constitutes about 10 per cent of all gliomata, are classified as medulloblastomata. These tumors occur chiefly in the vermis of the cerebellum in children. The average length of life of persons with such neoplasms is fifteen months. So far as the author is aware, no

one has ever succeeded in removing a medulloblastoma from the cerebellum so completely that the symptoms did not recur within a few months. Bailey has been able to prolong life just as long by roentgen irradiation.

Another common group of gliomata are classed as glioblastomata multiforme. These tumors usually occur in the cerebral hemispheres of adults. The average length of the clinical course is about twelve months. The symptoms often begin abruptly because hemorrhage and thrombotic softening frequently occur in the tumor. These tumors constitute from 20 to 30 per cent of all gliomata.

A group constituting about 10 per cent of all gliomata are the astrocytomata. These tumors grow slowly and have a tendency to undergo liquefaction which produces large cysts. The cysts practically destroy the tumors, but a small mural nodule of tumor always persists. If the cyst is emptied and the mural nodule is removed, the patient may survive indefinitely. Astrocytomata may occur in the cerebellum in children and produce symptoms early.

Smaller groups of tumors are classified as ependymogliomata, spongioblastomata, astroblastomata, spongioblastomata and ependymoblastomata, pinealomata and pineoblastomata, gangliogliomata, and neuro epitheliomata. However, from 12 to 15 per cent of the gliomata cannot be classified definitely in any of these groups.

If the histological nature of the tumor is known before operation the operability of the neoplasm and the method of attack can be better determined. Certain clinical syndromes have been recognized which indicate the type of tumor fairly definitely. Symptoms of a cerebellar tumor in childhood almost invariably mean either a medulloblastoma or an astrocytoma. Symptoms of a tumor developing in the cerebral hemispheres in adult life, especially during middle age or later indicate a malignant, rapidly growing and infiltrating glioma.

After exposure of the tumor a knowledge of its histological nature may be necessary to determine its further removal or subsequent treatment. This may be gained by examination with aspirated stains or of frozen sections.

ROBERT ZOLLINGER, M.D.

Marinescu, G., and Goldstein, H.: Multiple Tumors of the Nervous System. (Contribution à l'étude des tumeurs associées du système nerveux) *Ann. d'neurol. path.*, 1932, ix, 457.

Two cases of multiple tumors of the central nervous system are reported.

The first was that of a woman of twenty-six years who in 1899, after catching cold, experienced intense pain in the cervical region followed by a persistent

head suggested hydrocephalus the facial expression was usually bright and not apathetic as in idiopathic hydrocephalus. Percussion over the parietal region produced a dull note, whereas in hydrocephalus the note is tympanitic. The ocular fundi may show retinal hæmorrhages and various degrees of optic atrophy. Occasionally, papilloedema is present.

The diagnosis was established by puncture of the fontanel. In cases of hydrocephalus the ventricle is usually entered at a depth of from 1 to 2 cm and colorless ventricular fluid is easily obtained. In cases of subdural hæmatoma the fluid appears just after the click of piercing the membranous fontanel is heard. It varies from a slightly straw-colored fluid to almost pure blood, and gushes from the needle with each cry. This fluid must be differentiated from subarachnoid fluid which is sometimes increased in cortical atrophy and is slightly colored by the bleeding caused by the trauma of the puncture.

Trauma is considered to be the most important etiological factor, but the condition may be favored by malnutrition.

The hæmorrhage into the subdural space probably arises from injury to the superior cerebral veins which run from the cortex to the dura or longitudinal sinus. Organization occurs along the inner dural surface of the original hæmorrhage with the formation of very thin-walled vessels. From these thin-walled vessels there is a continuous transudation producing xanthochromatic fluid. Perhaps the increased intracranial pressure compresses the meningeal veins, augmenting the transudation through passive congestion. The thin-walled vessels may rupture and produce lamination of the membrane.

The outer membrane may be so thin as to be scarcely visible on the inner surface of the dura. The authors believe that it is only in this type of case that spontaneous recovery or recovery after repeated punctures of the fontanels may be possible.

The possibility of the spontaneous regression of a subdural hæmatoma might be determined by examining the membranes through a trephine opening. When the membrane is thin, conservative treatment may be tried. However, the thickness of the membrane does not determine the amount of fluid present or its rapidity of formation. If the hæmatoma is bilateral the authors tap the side opposite the side to be operated upon. This prevents subsequent pushing over of the brain with pressure on the brain stem by the fluid on the unoperated side after operation, when the intracranial pressure approaches normal. A moderate sized osteoplastic flap is then turned down over the frontoparietal region and the dura opened with the base toward the occipital region. The blue-black gelatinous membrane is removed without an attempt to go far beneath the dural incision. The underlying transparent or milky white membrane covering the depressed brain is removed from the arachnoid. The dura is then closed and the bone flap replaced without making a decompression.

The authors believe that operation is justified in cases of subdural hæmatoma in spite of its high mortality.

ROBERT ZOLLINGER, M.D.

Wiele, G. The Clinical Picture of Pituitary Disturbances on the Basis of an Erdheim Tumor of the Pituitary Gland (*Zur Klinik von Hypophysenstörungen an Hand eines Erdheimschen Hypophysentumors*) *Klin Wchnschr*, 1932, 1, 66.

In the case of a woman thirty-two years of age an Erdheim tumor of the craniopharyngeal canal was demonstrated roentgenologically by a shadow due to calcification above the normally formed sella turcica. The pressure of the tumor upon the anterior and the posterior lobe of the pituitary gland, the midbrain, and the chiasm caused hypogonitism, loss of axillary and pubic hair, amenorrhœa, marked deposits of fat on the hips and breasts, diabetes insipidus, somnolence, temporal atrophy of the optic nerve with homonymous color weakness on the right side, and a paracentral temporal color scotoma.

Following roentgen irradiation of the pituitary gland, vision again became normal, the patient felt well, her appetite improved (with the regular use of praeophyson), and her weight decreased. However the shadow due to calcification which was seen in the roentgenogram remained unchanged. The epiphyseal lines in the forearm, which were open previous to the treatment, became closed. Following the injection of extract of the posterior lobe of the pituitary gland (physormon) the diabetes insipidus promptly receded.

LAGNUS (O)

Cushing, H. The Surgical Mortality Percentages Pertaining to a Series of 2,000 Verified Intracranial Tumors. Standards of Computation *Arch Neurol & Psychiat*, 1932, xxvii, 1273.

The author gives the rules he has laid down for himself in the calculation of mortality statistics. He counts as a postoperative fatality every death in the hospital following an operation from any cause whatsoever, no matter how long the survival. He next defines what he considers an operation. Minor procedures performed for diagnostic purposes or purposes not directly related to the intracranial lesion are not considered operations. The stages of operations and secondary operations which are sometimes necessary are considered operations. He believes that an operation begins with the incision of the skin. Therefore death occurring immediately after the incision and before any possible damage could have been done is recorded by him as a postoperative fatality.

He then gives figures showing the gradual decrease in the mortality which has occurred in the thirty years of his enormous neurosurgical practice.

The principal factors responsible for the lowering of the mortality in intracranial surgery are summarized as follows:

1. The generally accepted methods of decompression to relieve tension.

Within the rigid capsule of the brain, brain compression does not advance uniformly. Any crowding process will press upon and squeeze blood and fluid from the adjacent parts of the brain first. This leads to diminution of the normal brain function with paralysis and degeneration in the immediate vicinity and later to a lability of the entire brain. The rigid falx and the tentorium form a barrier opposing even distribution of the pressure. A further division is caused by the cranial fossae. Between the cerebrum and the cerebellum there is a narrow space, the incisura tentorii, for the brain stem. When the parts of the brain become crowded they are displaced in the direction of least resistance, the hemispheres being displaced toward the incisura tentorii and the cerebellum toward the foramen magnum. As a result there is compression of the medulla oblongata which may threaten respiration and therefore life itself. This mechanical endangering of the vital centers is too little considered in tumor operations.

All measures which still further increase pressure on the brain must be carried out long enough before the operation for their effects to subside before the operation is begun. After ventriculography operation should be delayed at least eight days except in cases of internal hydrocephalus from tumor in which condition it should be performed immediately. Irradiations also increase the brain pressure and lead to greater hemorrhage at operation. In general, the author is opposed to irradiation of the closed skull.

Reduction of the pressure on the brain, especially before opening of the dura, is of the utmost importance for the successful outcome of an operation for brain tumor (danger of prolapse of the brain, sudden change in the pressure when the dura is opened). The simplest method of reducing the pressure is lumbar puncture either just before or during the operation. However this procedure favors prolapse of the cerebellum into the foramen magnum. The author has seen good results from its use after operation in cases of marked increase of pressure on the brain following the extirpation of a meningioma, but he warns against performing it if the extirpation of the tumor is not complete. He believes that, as a measure for relieving pressure before operation it should be abandoned. He regards ventricular puncture as the method of choice. Whenever possible, the operator should determine the change in the position of the lateral ventricle by ventriculography. Peiper shows by roentgenograms the changes produced in this ventricle by tumors of the frontal, temporal, and occipital lobes. Such roentgenograms show how best to carry out the puncture in a given case.

For the cases in which ventriculography cannot be carried out, preliminary subtemporal decompression is recommended. Peiper performs this on the right side eight days before the main operation. Frequently it will render trephination unnecessary. The latter should be avoided whenever possible especially on the left side.

Although our endeavor must be to locate the tumor and attack it surgically subtemporal and suboccipital decompressions are very effective as palliative procedures, the subtemporal procedure especially in cases of cerebral tumor and the suboccipital procedure in cases of subarachnoid tumor. However even in the latter a subtemporal valve may bring about retrogression of all phenomena of brain compression which may last for years. In spite of unfavorable experiences, the author prefers the subtemporal procedure. Especially in the cases of comatose patients, he is extremely loath to do a suboccipital compression. He has been willing to perform large skull resections over the occipital or parietal brain or over the vertex only when an inoperable tumor has been present at exactly these sites.

All decompression measures are inculcable in their effects as the displacement of important parts of the brain may bring about very threatening conditions. Among other measures to reduce brain compression which should be considered are intravenous injections of hypertonic solutions, especially a 50 per cent solution of dextrose. This dehydration procedure the author employs in the pre-operative and postoperative treatment of all cases of brain compression as it reduces the danger of surgical shock and of postoperative increase of brain pressure.

In the discussion of this report GUNDEL (Jena) stated that trephination over the tumor is the best type of trephination for decompression. In cases of tumor of the cerebrum it is not wise to perform a decompression trephination over the posterior cranial fossa.

CAPELLE (Berlin) recommended decompression by drainage of the lateral ventricle by a temporal approach. For the relief of brain compression under a healing decompression trephination he recommended the use of a probe knife to slit the dura.

BAUER (Goettingen) discussed the decompression required by brain compression in cases of tower skull. He stated that 14 per cent of the inmates of German institutions for the blind became blind as the consequence of tower skull. In this condition total circular craniotomy has proved of value. The entire upper calvaria is divided circularly and an opening from 2 to 5 cm. wide is made. In one case Bauer reduced the pressure in this way from 615 to 150-175.

STERNBERG (Zi-)

FEET, M. M. and KAHN, E. A.: Subdural Hematomas in Infants. *J. Am. M. Ass.*, 1913, xxviii, 85.

The authors report also cases of subdural hematoma occurring in infants and discuss the differential diagnosis between this condition and idiopathic hydrocephalus.

In the cases reported the first recognized sign of the condition was gradual enlargement of the head. As a rule this was accompanied by convulsions. It was seldom observed before the age of four months. The authors emphasize the fact that although the

physiological disturbances induced by such lesions. He emphasizes the diagnostic importance of dilatation of the internal meatus shown by X-ray examination. In their fresh state, the tumors are a typical yellowish-gray. Their relationship to the meninges, other cranial nerves, and the brain is discussed. Adelstein emphasizes the importance of early diagnosis. He considers it the duty of the otologist to see that patients with tinnitus and deafness receive a thorough examination at once to determine whether a tumor of the nervus acusticus is present or not.

HALL discusses briefly the effect of nicotine on the eighth nerve. He states that in acute infectious lesions in the cerebellopontine angle no characteristic histological changes are to be found, but purulent exudates tend to accumulate in large amounts in this area. He emphasizes that infectious material from the middle ear may pass by way of the lymphatics in the sheath of the eighth nerve to the brain, producing meningitis or a brain abscess. He reports two cases of osteomyelitis of the petrous portion of the temporal bone following middle ear disease. In discussing the relation of infectious granulomata to the eighth nerve he states that tuberculosis in the region of that nerve presents the same histological picture as tuberculosis elsewhere. He calls attention to the fact that as tuberculomata have a tendency to become multiple, the syndrome produced by them may be confused by the presence of tuberculous tumors in parts of the brain other than the cerebellopontine angle.

Luetic affections of the cerebellopontine angle are usually a part of a more or less diffuse gummatous meningitis which in a large percentage of cases results in impairment of the eighth nerve. Gummata of the eighth nerve may occur. Hall briefly discusses the pathological changes in the labyrinth and auditory nerves in congenital lues and in tabes. Following the report of a case of coccidioidal granuloma producing granulomatous nodules localized in the cerebellopontine angle, he describes in detail the histological findings in six neurofibromata of the eighth nerve to show the variation in these tumors. Other tumors of this region described by him are a meningioma of the psammoma type, a cholesteatoma, an ependymoblastoma, and an epithelial tumor of unusual type.

INGHAM reviews the symptoms of lesions of the eighth nerve in their relation to the history and the findings of examination. He considers tumors of the cerebellopontine angle a typical example of intracranial lesions involving the eighth nerve, giving rise to symptoms of irritation and destruction of both the vestibular and auditory divisions of the nerve, symptoms of involvement of the brain stem and cerebellum, and evidences of increased intracranial pressure. However, he calls attention to the fact that symptoms due to irritation of the vestibular nerve may be simulated by other conditions.

LEWIS discusses the vestibular symptoms due to qualitative and quantitative abnormal functioning

of the vestibular mechanism under different conditions and describes the various normal reactions to be expected from afferent vestibular impulses. The abnormalities include end-organ lesions, lesions at one or more points along the pathway, and lesions of the cerebral hemisphere or cortex. The lesion itself ranges from local or remote irritation or blocking of varying degree of recoverability to irrecoverable destruction, and from a single lesion to multiple lesions. It may be irritative, blocking, or destructive. The vestibular afferent impulses, in common with other afferent impulses, take part in tonogenesis. Lewis believes that diagnoses based upon careful analyses of sufficiently verified findings in vestibular function tests may be relied upon confidently, especially if they are supported by the history and the findings of the general physical examination and laboratory tests.

RAND discusses especially the surgery of tumors of the acoustic nerve. He reports in detail a case of acoustic neuroma and describes the typical and atypical symptoms of such tumors. In reviewing the various operative procedures advocated, he discusses the controversy as to whether partial or complete removal of the tumor should be attempted. Partial removal is favored by marked postoperative improvement over a period of years and by the favorable results which are obtained by secondary removal if this becomes necessary, but Rand believes the course to be followed should be determined by the findings in the particular case. He cautions against the use of spinal puncture as a diagnostic aid because the diagnosis may usually be made on the basis of the clinical syndrome.

HALE HAVEN, M.D.

De Kleijn, A., and Gray, A. A. A Case of Acusticus Tumor in Which Both Auditory Nerves Were Involved by Separate Growths. *Proc Roy Soc Med*, Lond, 1932, xxv, 1273.

The authors describe briefly the clinical course of a case of von Recklinghausen's disease and bilateral deafness in which death occurred twelve years after the onset of the ear symptoms and bilateral acoustic nerve tumors were found at autopsy. They call special attention to the following three unusual features of the case.

- 1 The tumor on the left penetrated the labyrinth and appeared in the middle ear through the round window.

- 2 There was a deposit of newly formed bone in the cochlear cavities in the left ear. The authors believe that this was the result of a disturbance of the nerve supply of the labyrinth, which probably explains also the formation of a similar deposit in cases of otosclerosis.

- 3 On the right side, in the apical whorl, the superficial portion of the stria vascularis appeared to have been loosened from the underlying portion by the accumulation of fluid underneath, a condition which the authors had noted in the cochlea of deaf-mutes.

LEO M. DAYDOFF, M.D.

2. Wound healing such that secondary infections are practically unknown.

3. Separate closure of the galea by buried fine black silk sutures, which has resulted in disappearance of the once dreaded fungus cerebri.

4. The introduction by De Martel of local anesthetics to take the place of ether inhalation anesthesia. When necessary this is now supplemented by the rectal administration of tribromethanol.

5. The more precise tumor localization in obscure cases which has been rendered possible by Dandy's ventriculography.

6. The use of a motor-driven suction apparatus, which is an indispensable adjunct to every intracranial operation.

7. The successive improvements in methods of obtaining hemostasis which, since 1917 have been most advantageously supplemented by the introduction of electro-surgical devices.

In conclusion the author states that mortality statistics are often as much influenced by pre-operative and postoperative care as by the operation itself.

ERIC OLSEN, M.D.

Royce, N. D.: Alteration of the Circulation of the Brain by Surgical Lesions in Diseases of the Central Nervous System. *Brit. M. J.* 1932, 1, 1065.

On the basis of studies made of experimental animals which exhibited alterations of muscle tone on the contralateral side and alterations in cerebral circulation on the ipsilateral side following section of the thoracic sympathetic trunk, the author states that the actual and possible applications of alteration of the circulation of the brain by such an operation on the sympathetic nervous system are many and varied. In clinical cases the operation consists in resection of the first thoracic sympathetic ganglion.

The main effect of such an operation is reported to be a diminution of tone in the contralateral extremities due to alteration of the cerebral circulation on the side operated upon. This effects a loss of rigidity on the contralateral side which becomes more pronounced with the passage of time after the operation. It is less noticeable in parkinsonian rigidity than in congenital spastic hemiplegia and congenital spastic paraplegia, conditions in which the basal changes are in the cerebral circulation.

Royce reports the results of sympathectomy also in cases of trigeminal neuralgia, retinitis pigmentosa, Raynaud's disease, encephalitis lethargica, congenital mental deficiency, deafness, headache, and epilepsy.

HALE HAYES, M.D.

Harrie, W. The Treatment of Trigeminal Neuralgia. *Brit. M. J.* 1932, 1, 87.

The author has had twenty-two years' experience with the injection treatment of trigeminal neuralgia. He prefers this treatment to open operation on the gasserian ganglion because it is not associated with risk to life. It is not followed by complications such

as hemiplegia, aphasia, and mental disorders which may develop after an open operation on the gasserian ganglion and it saves the patient time and expense.

With his technique, which he describes in detail, he is able to inject the gasserian ganglion so as to produce permanent anesthesia in any of the branches of the trigeminal nerve. He makes the injection under light morphine-scorpontanase or local anesthetic anesthesia, according to the wishes of the patient. Of the hundreds of patients he has treated in the manner described, many have now been free from pain for a number of years and may be considered permanently cured.

DAVID J. ISRAEL, M.D.

Courville, C. B. Applied Anatomy of the Eighth Nerve and Its Environments, the Cerebellopontine Angle. *Laryngoscope*, 1932, 42, 435.

Evans, N., and Courville, C. B.: Pathological Conditions Involving the Eighth Nerve and the Cerebellopontine Angle. *Laryngoscope*, 1932, 42, 433.

Adams, L. J.: The Pathological Anatomy of the Neopharynx. *Laryngoscope*, 1932, 42, 436.

Hall, E. M.: The Histopathology of the Eighth Nerve. *Laryngoscope*, 1932, 42, 432.

Ingham, R. D. Symplicology from the Standpoint of Neurology. *Laryngoscope*, 1932, 42, 434.

Lewis, K. R.: Vestibular Symptomatology. *Laryngoscope*, 1932, 42, 435.

Rand, C. W. Eighth Nerve Symptomatology from the Standpoint of Neurosurgery. *Laryngoscope*, 1932, 42, 431.

COURVILLE considers the applied anatomy of the eighth nerve from the developmental, the anatomical, and the histological aspects. He states that the difference in the extent of the glial part of its two portions is explained on an embryological basis and is thought possibly to account for the occurrence of tumors of the eighth nerve. The peculiar structure of the nerve and the variability of the related tissues explain the wide variety of the neoplasms occurring in the cerebellopontine angle. The soft texture of the central portion and the crowding of its constituent fibers account for its frequent damage in cranio-cerebral injuries and its susceptibility to injury and distortion by local neoplasms. Courville briefly reviews the essential histological and anatomical aspects of the nerve and discusses the anatomical limits of the region commonly known as the "cerebellopontine angle."

EVANS and COURVILLE, in the second article in this symposium, consider briefly the typical lesions in the cerebellopontine angle which involve the eighth nerve either primarily or secondarily. The grosser pathology of such lesions is described, and the suspected mechanism of their formation is discussed. The lesions considered include traumatic conditions, vascular conditions, infectious lesions, and neoplasms. Histological descriptions and the pathological physiology of the lesions are reserved by the authors for future articles.

ADAMS discusses the gross pathological and gross pathology of the nerve and the

ferentiated glomata and, according to the author should be called a "neuro-epitheliomata." Penfield reports a case of tumor of this type which arose from the ulnar nerve. The neoplasm showed rosettes of large undifferentiated cells with numerous mitotic figures in a coarse collagen stroma. It formed metastases and after ten months caused death.

In conclusion Penfield calls attention to the differentiation between perineurial fibroblastomata and the neurofibromata associated with von Recklinghausen's disease. In the latter, fibers of the parent nerve are characteristically present within the tumor, whereas in the perineurial fibroblastomata the fibers of the parent nerve are found on the capsule and not within the tumor substance.

LEO M. DAVIDOFF, M.D.

Bigler, J. A., and Hoyne, A. Ganglioneuroma. The Report of Two Cases, with a Review of the Literature. *Am J Dis Child*, 1932, xlii, 1552.

The authors report two cases of ganglioneuroma occurring in children.

The first case was that of a white boy five years of age who had an encapsulated tumor mass measuring 7 by 6.8 by 2.5 cm. at the level of the first two thoracic vertebrae on the right side of the mediastinum and a similar mass measuring 4 by 3 by 1.3 cm. under the right clavicle. No connection of either mass with a nerve or ganglion was found.

The second case was that of a colored boy four and a half years old who had a tumor mass measuring 7 by 5.5 by 4 cm. at the upper pole of the right kidney. The mass was distinctly encapsulated and definitely not a part of the kidney. There were no changes in the suprarenals, renal pelvis, or ureters.

In both cases the tumor masses had islands of ganglion cells interspersed with non-medullated nerve fibers and a supporting structure of connective tissue and blood vessels. One tumor studied in detail showed cells resembling microglia in the interstitial spaces about the ganglion cells.

The authors review and tabulate all of the ganglioneuromata that they were able to find reported in the literature. They group 86 of the neoplasms as simple ganglioneuromata and 11 as intermediate tumors.

They are of the opinion that operation is the only treatment that will cure.

Roentgen therapy has no apparent effect. A review of the literature tends to show that in operable cases the prognosis is good even though there is microscopic evidence of undifferentiated cells.

HALE HAVEN, M.D.

## MISCELLANEOUS

Milles, G., and Hurwitz, P. The Effect of Hypertonic Solutions on the Cerebrospinal Fluid Pressure, with Special Reference to Secondary Rise and Toxicity. *Arch Surg*, 1932, xlii, 591.

In a study of the cerebrospinal fluid pressure in a man and a number of dogs following the intravenous injection of hypertonic solutions, the authors found that the reduction of pressure produced by single doses of a hypertonic saline or dextrose solution was transient. There was a drop in the pressure during the first hour and then a rise or secondary return to normal consuming two hours, the entire period of effectiveness being almost three hours. There was then a period in which the pressure rose definitely above normal. The injection of sodium chloride solutions had a greater action in reducing the pressure and was followed by a greater reaction in the secondary rise. High concentrations of sodium chloride were found to be definitely toxic. Their toxic effect accounts for the occasional primary rise in the cerebrospinal fluid pressure associated with a drop in the blood pressure which occurs immediately after the injection of hypertonic salt solutions.

The authors believe it probable that recurrent pressure symptoms and the occasional deaths reported are due to the secondary rise in the cerebrospinal fluid pressure. EDWARD ZOLLINGER, M.D.

## SPINAL CORD AND ITS COVERINGS

Jurkiewicz, A.: Endomyelography for the Demonstration of Syringomyelic Cavities (Die Endomyelographie fuer die Darstellung der syringomyelischen Hoehlen). *Surf. Chir.* 193 1, 138.

The author undertook the puncture of syringomyelic cavities in eleven cases. In nine he obtained cerebrospinal fluid. In two of six in which the roentgen plate showed the lipiodol in the lower pockets of the dura mater he was convinced at operation that the cavity was situated at a site where the lipiodol had not penetrated. In two others, however, he found at operation that the lipiodol was in the cavity of the spinal cord.

He states that no neurological examination can reveal the extent of the cavity. However this can be determined by endomyelography by percutaneous puncture which was first carried out by Jurkiewicz and Vittek. This puncture, which has produced no ill effects when performed by these operators and by the author, may become of definite diagnostic and prognostic importance. It is of great value in establishing the indication for operation as well as in localizing the site for intervention.

HERMANN REIMERS (Z)

## PERIPHERAL NERVES

Pollock, L. J., and Davis, L.: Peripheral Nerve Injuries. Seventh installment. *Am. J. Surg.* 193 1, 137

In the seventh installment of their monograph on peripheral nerve injuries, Pollock and Davis confine themselves to a consideration of the median nerve. In war practice, lesions of the median nerve were second in number to lesions of the radial nerve. In contrast to the radial nerve, partial motor paralysis is often seen in incomplete lesions of the median nerve. The median nerve is also remarkable for the frequency with which its injuries are painful.

The authors describe in detail the motor symptoms of complete and partial nerve lesions, review the supplementary movements which may confuse the motor signs in median nerve palsy and discuss the mechanism of production of the latter. They describe the sensory symptoms and findings in lesions of this nerve and describe and show by illustrations the isolated supply of the median nerve and the area of residual sensation.

The vasomotor symptoms subsequent to injury of the median nerve vary. The skin of the palm is often discolored, purplish cyanosed, cold, or red. The skin is dry and chapped, and at times keratotic. The authors have noted ridging and hypertrophy of the nail beds even when vascular damage was not present.

In partial lesions of the median nerve flexion of the index finger and opposition of the thumb are the movements most commonly defective. In partial lesions, sensation is rarely lost completely and in a large proportion of partial or recovering lesions sensory regeneration is present when motor phenomena

give no indication of regeneration. In recovering lesions the pronator and palmar muscles are last to regain functional activity and the flexor of the index and opponens pollicis are among the last.

In civil life, a differential diagnosis is necessary when paralysis and atrophy of the muscles supplied by the median nerve may be the result of cervical ribs, syringomyelia, or other disease of the anterior gray matter of the cord. Hysterical paralysis and "congealed" hands must also be differentiated. The authors discuss the differential diagnosis of these lesions in detail.

Following a review of the anatomy and physiology of the median nerve, the relations of the nerve which are of surgical importance are discussed and the lesions and methods of exposing the nerve at various levels along its course are described and illustrated. Also described are methods of transposition to overcome continuity defects and obtain the preferred end-to-end suture.

The treatment of caualgia is considered because of its frequency in median nerve lesions. All of the previously advocated treatments are reviewed and the conclusion is drawn that as long as the pathogenesis of the condition remains obscure no one surgical procedure may be recommended as the only completely successful method of treatment. Reexcision and suture of the nerve trunk above the lesion as advocated by W. H. Mitchell seems to the authors at present to be the most efficient treatment.

HALE RAYNER M.D.

Penfield, W.: Tumors of the Sheaths of the Nervous System. *Arch. Neurol. & Psychiat.* 193 1, 170, 190.

Penfield first discusses fibroblastic tumors arising from the meninges which he calls "meningeal fibroblastomas." These tumors were formerly known as "psammomata," "dural endotheliomata," and "dural sarcomata," terms which have been generally discarded. Penfield objects to Cushing's term "meningioma," because it does not indicate the histological structure of the neoplasm. He prefers the use of the term "meningeal fibroblastoma," also to division of the neoplasms into meningioma, meningiotheliomata, fibroblastic, psammomatous, and astroblastic meningioma as suggested by Bailey and Bucy. He states that, if desired, the term "meningeal fibroblastoma" may be qualified by such words as "little differentiated" or "psammomatous" according to the degree of differentiation of the neoplasm.

With regard to the tumors designated as "schwannoma," "schwannoma," "solitary neurofibroma," and "cerebellopontine angle tumors," he states that these neoplasms arise from the connective tissue cells of the perineurium or endoneurium. He therefore urges that they be called "perineurial fibroblastoma."

Rarely tumors arising from the cells of Schwann or their precursors are seen in association with peripheral nerves. Such tumors resemble medi-

JAFFÉ objected to Pribram's use of the term "degeneration." He objected also to the word "precancerous" as changes which can be demonstrated histologically to be precancerous occur only in the skin. In other organs pathologists are unable to determine precancerous changes.

A ROSENBERG (Z)

Dawson, E. K. Sweat-Gland Carcinoma of the Breast. *Edinburgh M J*, 1932, XXXIX, 409

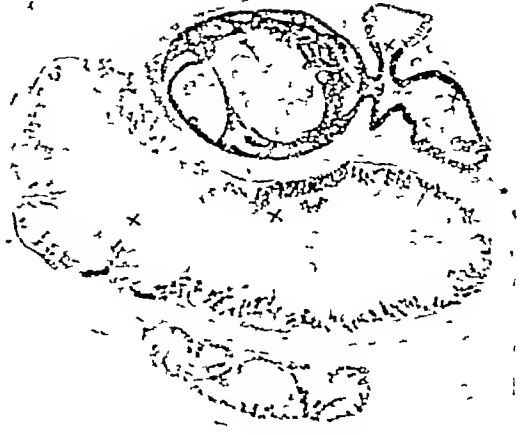
A striking histological feature noted in sections of cystic breast material is the glandular tissue lined by large eosinophile cells. The cells are always larger than those of ordinary mammary epithelium. Under low power magnification the cytoplasm looks clearer, and the eosinophile staining gives it a paler appearance. This lining membrane is referred to as "pale epithelium" or "epithelium of sweat-gland type." In all cases this pale epithelium in the breast lines a definitely cystic structure. Even the smallest pale structures are always larger than normal mammary acini.

The author bases his conclusions on the examination of 1,200 large breast sections and numerous smaller sections from more than 600 cases of tumor and other conditions and from normal breast tissue. He believes that pale epithelium in the breast is derived, apparently in all cases, from normal mammary glandular tissue and has no demonstrable connection with actual sweat-gland structures. Such structures are not found in normal, non-cystic breast tissue. This epithelial proliferation with subsequent degeneration may be found in various conditions of mammary activity and at different ages, but is predominantly associated with glandular involution of the menopausal period, when cystic conditions of the breast are most common.

Dawson regards the pale changes as post-proliferative. He believes it indicates a degeneration which supervenes on the earlier epithelial activity of normal cells and checks it. He is therefore of the opinion that malignant possibilities are not present in the pale cell. This view of the degenerative character of pale epithelium finds much clinical support in the long-maintained benign course of cystic breast conditions which histologically show widespread pale changes.

Of the 120 cases of malignant tumor in which examinations of whole breast sections were made, 116 showed the presence of pale epithelium in addition to the malignant tissue, but in no case was the origin of the carcinoma to be attributed to the progressive proliferation of the pale cells. Even when the malignant tissue suggested a similarity to the pale cells, the transition to the malignant cell-type could be traced from normal mammary epithelium lining a large or small duct, the non-proliferative stage of which showed no indication of the pale change.

The theory that pale epithelium of the breast has no connection with actual sweat glands, and no malignant tendency and is essentially a type of



Transition from normal to pale epithelium in mammary tissue

epithelial degeneration is strengthened by the fact that pale epithelium has been observed in other organs of the body, such as the ovary, uterus, prostate, and kidney, where glandular activity followed by epithelial degeneration and cyst formation is frequent.

EARL O LATIMER, M.D

## TRACHEA, LUNGS, AND PLEURA

Nissen. Indications for Operative Interference in Cases of Injury to the Lungs and Bronchi (Die operative Indikation bei Verletzungen von Lungen und Bronchien) 56 *Tag d deutsch Ges f Chir*, Berlin, 1932

The determination of the indications for operative interference in chest injuries is very difficult as even slight injuries may be associated with shock brought about by expiratory tension interfering with respiration. This condition may be produced experimentally by irritating the vagus. The irritability of the vagus depends upon contact between the lung and the chest wall. In hemothorax and pneumothorax it is abolished. Under such conditions there is serious interference with respiration, and artificial respiration with positive pressure is of great value.

In cases of injury to the lung there is often an emphysema of the mediastinum which may produce an extrapleural cardiac tamponade. In this condition an incision in the jugular fossa to let out the air may give relief and even save life. The author shows the spread and sequelæ of the mediastinal emphysema by roentgenograms.

As a rule chest injuries are associated also with vascular injuries leading to severe intrathoracic hemorrhage. Vascular complications constitute the chief indication for operation. The bleeding vessel must be exposed by thoracotomy. The author describes how the hilus of the lung may be tempo-



# SURGERY OF THE CHEST

## CHEST WALL AND BREAST

Borchardt M., and Jaffé, R.: The So-Called Cystic Breast (Die sogenannte Cystadenoma) *Zentralbl. f. Chir.* 932 p. 673.

Borchardt states that by the term "cystic breast" he refers only to cystic breast of the Reclus type. Macroscopic examination in this disease reveals a diffuse distribution of cysts varying in size from that of a pinhead to that of a plum. Occasionally the condition is confined to one sector of the breast, but frequently it is bilateral. Some consider the primary and most important lesion to be the proliferation of the connective tissue, while others believe it to be the proliferation of the epithelium. Borchardt differentiates the involution cysts of mastopathia cystica dysplastica from cystic breast of the Reclus type. Mastopathia cystica dysplastica occurs also in youth. The most important question is the relation of this disease to cancer. The apparently high incidence of cancerous degeneration in mastopathia is explained by the fact that only cases with evident or suspected cancerous degeneration come to operation and therefore to microscopic examination.

To determine if and how often, anatomicopathological changes of the Reclus type occur in women over forty years of age who present no clinical evidences of disease, Borchardt and Jaffé made a study of 300 breast glands from 300 such women. They found that in all portions of the glandular tissue and the excretory duct system, 3 types of cysts may occur—one with low flat epithelium and smooth walls and the other with high columnar epithelium. Proliferations of the glandular epithelium occurred in both types, but were especially frequent in the cysts with high epithelial cells. Cysts of the latter type were found in one breast of 65 per cent of the women and in both breasts of 30 per cent. Formerly they were suspected to be cancerous, especially when proliferations were found within them. The authors have come to the conclusion that the cystic breast is the result of a hormonal disturbance of the menstrual cycle of the breast and not, as was formerly believed, the result of stasis of secretion, inflammation, malformation, or tumor.

As the normal menstrual cycle of the breast has its parallel in the menstrual changes in the uterine mucosa, the well-known pathological changes in the uterine mucosa—such as hyperplasia and cyst formation, which are also due to abnormal hormonal stimulation—must be considered as corresponding to cyst formation in the breast. The authors conclude that these cyst formations are not always precancerous as they found such cysts in the breasts of women seventy and eighty years of age. They believe that the diagnosis of cancer is warranted

by cyst formation and intracystic proliferation only when definite signs of malignant growth, such as atypical cells, mitoses, and infiltrating growth, are observed.

If we accept the dictum of Klose that mastopathia cystica always leads to carcinoma within from twelve to eighteen months, 93 per cent of women over forty years of age should have a unilateral breast amputation and 30 per cent a bilateral breast amputation. However, it has been proved that mastopathia cystica is much more frequent than was hitherto supposed and may occur in very early life. It progresses slowly; it may become arrested at any stage, and it may persist until death without becoming cancerous. Arbitrary differentiation between a latent and an active stage of the disease.

Therefore, in the cases of young women, Borchardt proceeds conservatively. He punctures large cysts and sometimes excises well-localized involvement. In the cases of women over forty-five years of age he amputates and cleans out the axillary glands if the involvement is extensive.

In the discussion of this report, PRIBRAM stated that cystic degeneration is nothing more than an exaggeration of the physiological process of atresia formation in which the lumina of the acini become progressively larger. In addition, all of the stages of mammary gland and menstrual changes are seen. Pribram spoke of a "degeneration," but used the term differently than other pathologists. He stated that as cystic degeneration and carcinoma are both found frequently in the breast, it is not surprising that they are often associated with each other but this fact does not prove that cancer is more common in the cystic breast than in the non-cystic breast. In his opinion, the bleeding from the nipple has no relation to cancer formation. He stated that this bleeding comes from a cysto-epithelioma near the nipple which is relatively benign as it rarely causes metastases and very seldom recurs after excision. For both the cystic breast and the cysto-epithelioma he recommended removal of the glandular portion of the breast with preservation of the fatty portion.

MICHAEL stated that in the cases of young women he frequently removes isolated painful nodules of the breast. Occasionally in such cases he finds only a harmless fibroma, but in some of them he discovers a cystic condition of the breast. In the case of older women he amputates the breast. In the absence of malignancy he does not clean out the axilla, but if the tumor proves to be cancerous, he cleans out the axilla from two to three days later.

In conclusion BORCHARDT condemned partial amputation of the breast and demanded radical operation with cleaning out of the axilla in the cases of elderly women.

bination of separation with resection of one or two ribs without tamponade

In cases of tuberculous lesions of the lung without septic pleural complications in which pneumothorax is impossible or insufficient, it is necessary, whatever the extent or situation of the lesions, to consider first the advisability of phrenicectomy. Even when involvement of the other lung is suspected, this operation does not seem to have serious inconveniences. Nearly always, it is followed by improvement, and in more than 20 per cent of the cases it results in regression and cicatrization of the lesions.

If phrenicectomy fails, resection of the first seven ribs should be done. When this is combined with phrenicectomy it results in a cure or marked improvement in a considerable percentage of cases.

When high thoracotomy does not suffice, it may be supplemented a month later by low thoracotomy and, if there is room, by anterior resection of the ribs or a limited tamponade of the apex with paraffin. The only essentials are clinical integrity of the other lung, a good general condition, and a good condition of the cardiovascular system.

In cases of very limited apical lesions which require operative treatment but in which pneumothorax is impossible, recourse may be had to apicolysis combined with phrenicectomy, an operation which may return the patient to almost normal life in a few weeks. Of all the procedures for very limited lesions, paraffin tamponade gives the most constant good results with the least sacrifices.

Apicolysis may be done also in cases in which thoracotomy is contra-indicated by involvement of the other lung. In such cases it may be done to dry up the septic secretions of an apical cavity and thereby favor healing of the lesion in the other lung. In the cases of patients with fever, debility, or tachycardia, apicolysis with limited paraffin tamponade is the simplest operation and the most sure. The truly surgical apicolysis should include posterior resection of the first three ribs and liberation of the suspensory ligaments of the pleura, especially if there is a pneumothorax on the other side which forbids mobilization of the free pleura on the side of the operation.

PAGE.

De Souza, O., and Maciel, P. Clinical and Roentgenological Study of Pulmonary Abscess (Estudo clinico radiologico do abscesso pulmonar). *Rev de radiol clin*, 1932, 1, 223.

The authors review the progress of the last few years in the study of pulmonary suppurations. They call attention to the variable character of the symptoms which makes it imperative for the physician to resort to all available means of clinical research and emphasize the importance of roentgen study which, even if it does not yield absolutely decisive findings in all cases, gives valuable information as to the location, extent, and progress of the pulmonary process.

Following a discussion of the differential diagnosis between pulmonary abscess, interlobar pleurisy, sup-

purative hydatid cyst, bronchiectasis, tuberculosis with cavitation, and pulmonary carcinoma with cavitation, they take up the etiology and pathogenesis of pulmonary abscess, the role of amœbiasis and spirochaetosis, and treatment with emetin and by bronchoscopy and surgery.

JAMES T. CASE, M.D.

Roussy, G., and Huguenin, R. Views on the Pathological Anatomy of Cancers of the Lung (Vues sur l'anatomie pathologique des cancers du poumon). *Arch. mèd.-chir. de l'appar. respir.*, 1932, 17, 503.

From a study of the pathological anatomy of different types of cancer of the lung it appears that the slowly growing circumscribed cancers are usually of the malpighian type and not radiosensitive, whereas the mediastinopulmonary tumors, which grow rapidly, are composed of small cells and are sensitive to irradiation.

Grossly, cancers of the lung appear in various forms—circumscribed, eccentric, round, and relatively encapsulated, a pseudolobar form, a massive form, a form spreading over the surface and to the pleura, a mediastinopulmonary form, and a nodular form. Secondary changes due to necrosis or infection often cause changes such as cavity formation within or external to the tumor. The site of a circumscribed tumor is important particularly in cases of cancer of the hilum and small cancers of the wholly endobronchial type. When a circumscribed cancer is located peripherally, an examination for pleural involvement should be made by diagnostic pneumothorax. The circumscribed cancer tends to retain its type over a long period even when it is surrounded by associated lesions. The lobar type of neoplasm tends to remain with the lobe in which it develops. Cancers arising at the hilum tend to spread outward toward the surface, and those of the mediastinopulmonary type rapidly involve the mediastinum.

The clinical signs vary according to whether the cancer is deep or superficial, local or extensive, and whether it involves the mediastinum or the pleura. Adjacent atelectasis, inflammatory lesions, or cavities alter both the clinical and the roentgen signs. The relation of the neoplasm to the bronchi should be carefully studied.

Histological study reveals marked polymorphism. Many varieties of cells are often seen in the same tumor, and the metastases may differ from the primary neoplasm. Most lung cancers are bronchogenic and arise from the smaller bronchi. True alveolar cancers are rare in the lung. The cancer may be frankly epithelial with pearls, it may show masses of cells, it may be cylindrical and glandular, or it may be composed of small undifferentiated cells.

For a thorough study of cancer of the lung roentgenography, bronchoscopy, bronchography, and pneumothorax should be employed.

FRANK B. BERRY, M.D.

rarily squeezed off by means of a rubber tube to facilitate approach to the bleeding vessel. Torn bronchi must be ligated suturing is of no avail as the sutures give way. Bleeding frequently occurs also from lacerations of the lung tissue. Under such circumstances the mediastinum is displaced toward the injured side, whereas in cases of pleural effusion it is displaced toward the other side.

In the discussion of this report HARRIS showed with roentgenograms the spread of mediastinal emphysema produced by the introduction of air into the upper portion of the mediastinum. The influence of the diaphragm in hindering the outflow of blood through the chest was shown by injecting strodl into the femoral vein. The column of blood could be followed up to the diaphragm where, when sufficient pressure was applied to the mediastinal thorax, only a small column of fluid passed on from the diaphragm and entered the heart. The influence of the pressure exerted by the air injected into the mediastinum was manifested also by congestion of blood in the right heart and the pulmonary vessels. Relief of the pressure in the mediastinum by escape of the injected air through the diaphragm into the retroperitoneal space, the bursting of air bubbles into the thoracic cavity or release of the air from the mediastinal thorax by incision into the mediastinum through the fogatum resulted in immediate relief of the circulatory difficulties in the thorax.

Nasser (2)

Singer, J. J. A New Portable Pneumothorax Machine. *J. Thoracic Surg.* 1934 1, 306

The portable pneumothorax machine described by the author is made almost entirely of metal and weighs only 10 lb. It consists essentially of two chambers, one above the other. In order to prevent corrosion, mineral oil is used instead of water. The manometer consists of a bellows enclosed in a metal case. The dial is graduated in cubic centimeters of water. Air can be introduced or withdrawn from the chest through the commutator valve in the center of the instrument, and pleural pressure readings may be taken by changing the handle of this valve.

The advantages claimed for the machine are simplicity of operation, sturdiness, portability without danger of breakage or leakage and visibility of all indicators.

East O. LATIMER, M.D.

Cardis, F., and Bourguignon, J. The Picture of Pachypleuritis with Re-Expansion in the Course of Therapeutic Pneumothorax (usage particulier de pachypleuritis et re-expansion au cours du pneumothorax thérapeutique). *Arch. mal. chr. & Tupper suppl.* 35 4, 42.

Pachypleuritis generally occurs in the course of active pneumothorax treatment. In the roentgenogram it is manifested by fine lines which usually assume the form of a semicircle or semi-ellipse centered on the hilus, but occasionally are peripheral. They circumscribe a zone that is often denser than the rest of the pneumothorax and has sharp ex-

ternal boundaries. The clear internal zone corresponds to a tongue of lung which is adherent to the thoracic wall. The adhesion is progressive.

The shell of lung which adheres firmly to the thoracic wall is unaltered by respiration. It is very thin and hence very transparent to the rays. The authors believe that the picture described appears in cases in which there is a generalized thickening of the parietal pleura and that the latter is thicker than the visceral pleura.

Over the adherent plaque of lung, a faint respiratory murmur and sometimes adventitious sounds may be heard. Rattles become painful and may be impossible at the costal site. The pressure increases and respiratory oscillations diminish. The last two changes occur in all cases of stiffened pleura. In all of the authors' cases presenting the picture described field of varying amount and consistency was present.

If the pneumothorax has been effective over a long period, the lung may be allowed to re-expand under careful control. If the pneumothorax is recent and has shown good results, elastothorax may be substituted for it, but if the pneumothorax has been ineffectual or incomplete, pleurotomy or thoracoplasty is indicated.

F. LUX B. AUBRY, M.D.

Ponomarev, I. G. Histological Changes in the Lungs After Phrenic Nerveostomy and Their Resemblance to Those Following Pneumothorax (Istobrazheniya izosticheskoe del' pulmonov posle trepaniya loro analogie s onymi de pnevmothorak). *Russkaya literatura d. chis. i slov.* 1934, 264, 464.

In experiments on three dogs the author performed phrenic nerveostomy by the technique of Coudereff and two months later injected intravenously 100 ccm. of a saturated solution of sodium carbonate containing carmine. After the death of the animals he compared sections of their lungs with sections of the lungs of a control dog which was not stained vitally. In the lungs of the experimental dogs histological examination showed marked venous stasis, proliferation of connective tissue, and the presence of reticulohistiocytes. These findings are similar to those made after collapse of the lungs by pneumothorax.

ROBERT T. LEBER, M.D.

Bégin, L., and Ahmed, I. Apicostyle. Pleuro-parietal Separation of the Apex of the Lung. Technique, Results, Indications. (L'apicostyle. Découpage pleuro-parietal du sommet du poulmon. Techniques, résultats, indications). *Arch. franc. chir. d. fr.* 9 23, 230, 24.

In 1917 Tuffier seeking to extirpate the apex of a tuberculous lung, was led, on account of adhesions, to separate the parietal pleura from the rib. He realized that such a separation constituted a route of access which could be enlarged for exploration or compression of the per.

The technique has since been variously modified. Changes have been made in the approach, the tamponade, the tampon material, and the com-

# SURGERY OF THE ABDOMEN

## ABDOMINAL WALL AND PERITONEUM

Birkenfeld, W. Peritonitis of Renal Origin (Zur Kenntnis der Peritonitis renalen Ursprungs) *Chirurg.*, 1932, IV, 333

Penetration of pus into the peritoneal cavity from the kidney region is rare as the peritoneum offers considerable resistance to the spread or penetration of pus.

The author reports the case of a three-year-old girl with suppurative peritonitis and basal empyema on the left side which were caused by the degeneration of a hypernephroid growth of the left kidney. As the tumor of the kidney had produced no clinical symptoms, only empyema and peritonitis were considered in the diagnosis. Laparotomy revealed intense congestion of all of the bowel loops with only a very small amount of fibrin deposit and a small quantity of cloudy exudate in the peritoneal cavity. The cause of the peritonitis was found at autopsy, but a perforation could not be demonstrated. Bacteriological examination disclosed the presence of hemolytic streptococci.

In conclusion the author says that in all cases of peritonitis in which the focus of infection is not evident the kidneys should be examined at operation.

BODE (Z)

## GASTRO-INTESTINAL TRACT

Cole, L. G., and Others. Roentgenological Exploration of the Mucosa of the Gastro-Intestinal Tract. *Radiology*, 1932, XVII, 221

Cole, L. G., and Others. Important Anatomical Data of the Digestive Tract. *Radiology*, 1932, XVII, 471

Cole, L. G., and Others. Findings Observed in the Gastro-Intestinal Tract. *Radiology*, 1932, XVII, 886

This is a comprehensive presentation of the roentgenological examination of the digestive tract which appeared serially under separate titles, a résumé of which was presented by Cole at the Third International Congress of Radiology in Paris in 1931. It includes personal communications from many of the foremost American roentgenologists, an extensive study of the foreign literature with translations into English, and material collected from various institutions with which the authors are associated. It is profusely illustrated, and the legends accompanying the illustrations are so complete as to make them a valuable contribution in themselves.

The report is introduced by a detailed review of the history of the development of gastro-intestinal roentgenology, including reports of isolated attempts at practical use of the X-rays in diagnosis soon after their discovery and the various steps which brought

roentgen diagnosis to its present-day perfection. The European technique of fluoroscopic examination with "symptom complexes" as the criteria for interpretation of the findings which followed the introduction of the Rieder meal in 1904 is contrasted with the direct method based on morphological changes observed roentgenographically. The latter was rendered feasible by improvement in apparatus and technique which permitted rapid and numerous exposures with safety and satisfactory negatives. Cole was largely instrumental in establishing the advantages of this method by what he termed "serial roentgenography."

At the time that the serial method was being established it was noted that the mucosal pattern is of great significance, especially in the diagnosis of organic lesions and the differential diagnosis of malignant lesions from spasm. In the first installment of this report this is discussed at some length. In 1900 Cole attempted to demonstrate the mucosal pattern on the anterior and posterior walls of the stomach by the sedimentation of bismuth subnitrate from a watery suspension. More recently the same result was obtained by various workers by compressing relatively small amounts of opaque suspensions or meals of different consistency. Some investigators have combined the use of air or gas and an opaque suspension, claiming that much additional information may be obtained thereby, especially in examinations of the colon. For a time Cole and his co-workers used both the serial method and the special mucosal technique in the same cases in order to determine which would be the more satisfactory as a routine procedure. The serial method with a moderately filled stomach, although more expensive, seemed to be of much greater value than the special mucosal technique. Accordingly, the special mucosal technique was used thereafter only as an adjunct in specific cases. Serial roentgenography was applied also to the mucosal technique.

The authors' technical methods and certain principles of procedure which have been found useful are described with considerable detail under the following headings:

1. Apparatus—technique of serial roentgenography
2. Preparation of the patient
3. Choice and administration of the opaque medium and roentgenographic projection and posture of the patient
4. Application of the roentgen rays. This includes a discussion of the factors employed to prevent the development of secondary rays or to obviate their detrimental effects as related to the gas tube, the cone, compression, the grid, and close apposition of the film to the opaque medium.

## MISCELLANEOUS

Nielsen, R.: Progress in Thoracic Surgery (Fort-  
schritte in der Thorax-chirurgie) *Deutsche Zeitschrift f*  
*Chir.* 1931 *ccxcviii*, 545

The author reviews the progress of thoracic surgery since Sauerbruch's presentation on the subject at the forty eighth meeting of the Deutsche Gesellschaft fuer Chirurgie. He states that our knowledge of the physical processes that are so important for an understanding of morbid processes in the thorax have been advanced especially by investigations of the blood supply of the lungs and disturbances of physiological pressure conditions. He emphasizes the importance of the relation of the mediastinum to an understanding of the changes from normal physical conditions, and discusses the disturbances of the circulation in the lungs in detail.

The preferred types of anesthesia for thoracic surgery are basic avertin narcotics and ether anesthesia combined with positive pressure. However local anesthesia is still the choice for all intrathoracic operations in which actively secreting pus cavities must be opened.

Operations for the treatment of emphysema are still very limited in number whereas new methods have been devised for the treatment of infundibular thorax.

With regard to the surgery of the heart, Nielsen discusses the results of the Trendelenburg operation and the result obtained by Sauerbruch from operation on an aneurism of the right heart. For the treatment of suppurative pericarditis with effusion, procedure combined with the use of Boeck's siphon drainage is especially recommended.

Mediastinal emphysema has been successfully treated on several occasions by incision in the jugulum. In the treatment of acute mediastinitis no great progress has been made. Only the opening of mediastinal suppurations from the oesophagus by the oesophagoscopic method has been successful.

In the treatment of cancer of the oesophagus no noteworthy progress has been made. For cardio-splanic attempts at dilatation with Starck's sound, are especially recommended. In resistant cases, oesophagostomy by the method of Heyrovsky is indicated.

Of particular importance is the chapter on the operative treatment of pulmonary suppurations. For these extrapleural tamponade is especially

recommended. If the abscess is not evacuated by coughing there remains the possibility of rupture into the bed of the packing or of opening the abscess cavity from the latter. With regard to the treatment of bronchiectasis, Nielsen discusses at length paralysis of the diaphragm extensive rib resection, tamponade, and extirpation of the diseased part. In the Sauerbruch clinic extirpation of the involved part of the lung has been repeatedly carried out with success in the cases of patients between the ages of ten and thirty-five years.

Benign tumors of the lung have been extirpated repeatedly but in cases of carcinoma of the lung Walz's radical operation has remained up to the present time an isolated success.

The indications for treatment of pleural suppurations are rigidly limited, while the rules for the surgical treatment of pulmonary tuberculosis have been further developed. Nielsen recognizes the value in individual cases of open division of adhesions and, in opposition to the old demands of Sauerbruch, for certain cases he recommends compression of the upper portion of the lung by partial plastic procedures and tamponade either above or with compression of the lower portion by pneumothorax. In general, pneumothorax is given greater recognition in this review than was accorded it by the Sauerbruch school.

To determine the condition of the circulation in doubtful cases Nielsen recommends testing it first under positive pressure and then under negative pressure. A rapid fall in the blood pressure and an increase in the pulse rate are a warning for crisis.

The advisability of operating is one or two stages must be decided on the basis of the findings in the individual case. In some cases an incomplete result from a paravertebral plastic operation can be perfected by auxiliary rib resection. For incompletely collapsed cavities in the apex of the lung apicalysis combined with extrapleural tamponade may be considered. The ideal indication for pneumothorax with subsequent tamponade is present when there are cavities in the apical portion of an otherwise healthy lung. In bilateral involvement, tamponade has not met expectations. Success is equally uncertain in cases of cavities in the upper and middle portions. In individual cases extrapleural pneumothorax has proved of value when the condition was very unfavorable and it was no longer possible to obtain compression by simpler means. Von Rosen (2).

# SURGERY OF THE ABDOMEN

## ABDOMINAL WALL AND PERITONEUM

Birkenfeld, W. Peritonitis of Renal Origin (Zur Kenntnis der Peritonitis renalen Ursprungs) *Chirurg*, 1932, 14, 333

Penetration of pus into the peritoneal cavity from the kidney region is rare as the peritoneum offers considerable resistance to the spread or penetration of pus

The author reports the case of a three-year-old girl with suppurative peritonitis and basal empyema on the left side which were caused by the degeneration of a hypernephroid growth of the left kidney. As the tumor of the kidney had produced no clinical symptoms, only empyema and peritonitis were considered in the diagnosis. Laparotomy revealed intense congestion of all of the bowel loops with only a very small amount of fibrin deposit and a small quantity of cloudy exudate in the peritoneal cavity. The cause of the peritonitis was found at autopsy, but a perforation could not be demonstrated. Bacteriological examination disclosed the presence of hemolytic streptococci

In conclusion the author says that in all cases of peritonitis in which the focus of infection is not evident the kidneys should be examined at operation  
BODE (Z)

## GASTRO-INTESTINAL TRACT

Cole, L. G., and Others. Roentgenological Exploration of the Mucosa of the Gastro-Intestinal Tract. *Radiology*, 1932, XVIII, 221

Cole, L. G., and Others. Important Anatomical Data of the Digestive Tract. *Radiology*, 1932, XVIII, 471

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At the time that the serial method was being established it was noted that the mucosal pattern is of great significance, especially in the diagnosis of organic lesions and the differential diagnosis of malignant lesions from spasm. In the first installment of this report this is discussed at some length. In 1909 Cole attempted to demonstrate the mucosal pattern on the anterior and posterior walls of the stomach by the sedimentation of bismuth substrate from a watery suspension. More recently the same result was obtained by various workers by compressing relatively small amounts of opaque suspensions or meals of different consistency. Some investigators have combined the use of air or gas and an opaque suspension, claiming that much additional information may be obtained thereby, especially in examinations of the colon. For a time Cole and his co-workers used both the serial method and the special mucosal technique in the same cases in order to determine which would be the more satisfactory as a routine procedure. The serial method with a moderately filled stomach, although more expensive, seemed to be of much greater value than the special mucosal technique. Accordingly, the special mucosal technique was used thereafter only as an adjunct in specific cases. Serial roentgenography was applied also to the mucosal technique

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The second of the series of articles is devoted to anatomical factors of importance to an understanding of the roentgen findings and the correct application of the roentgenological method of examination to elicit the information desired. Position, relationship to adjacent organs, gross and minute structure and function are considered. The first part of the duodenum, commonly known as the "bulbus duodeni," is described as part of the stomach. The name *cap*, which Cole attached to it in 1912 has acquired quite general application, at least among roentgenologists. Some of the characteristics which render this part of the duodenum particularly vulnerable to ulceration and can be easily recognized in the roentgenogram are described at length. Special emphasis is laid on the fold between the body and the antrum of the stomach which is called the "sulcus angularis," and the fold between the antrum and the cap which is usually called the "pyloric valve." Both of these folds differ in structure from the rest of the stomach. Peristalsis is supposed to occur in cycles with characteristic amplitudes and diastoles.

The small intestine is divided into two main parts, the duodenum and the mesenteric intestine which is intraperitoneal. The former has its beginning at the first *plicae circulares* and terminates at the duodeno-jejunal junction, which is usually the highest point reached by the small intestine. The mesenteric part is further subdivided into five groups of coils, a subdivision apparently justified by embryological development. The first two of these groups are located in the left hypochondrium and lumbar region respectively, usually extend transversely and are more or less discrete. The third group is found in the umbilical region and upper hypogastrium, and the fourth group in the right lumbar region. The fifth group is located in the right iliac fossa, the false pelvis or lower hypogastric region. Distinct visualization of these groups depends largely upon their position in the abdomen.

The generally recognized divisions of the colon and their common variations are described. Attention is called to congenital folds or bands which sometimes alter function as it is observed roentgenologically. The authors believe that the semilunar folds which protrude into the lumen of the colon, dividing it into maculations or haustra are composed of a reduplication of mucosa muscularis mucosae, and a core of submucosa. From roentgenographic studies of the colon and a study of specimens of the colon they have come to the conclusion that the semilunar folds which form the haustrations of the colon are formed actively by contraction of the muscularis mucosae and are not due to contraction of the muscularis propria and are not passive formations due to contraction of the longitudinal bands. They describe the anatomical and physiological tonic contraction areas occurring in the cecocolic region and the proximal parts of the transverse colon and the rectosigmoid region which

may explain findings occasionally noted in these parts.

The fundamental findings constituting the criteria for exploration of the mucosa of the gastro-intestinal tract are: (1) the lumen of the tract viewed in profile, (2) special folds of the mucosa viewed on edge, (3) the pliability of the mucosa to peristaltic contraction, and (4) the pattern of the mucosal folds or rugae. Each of these is evaluated in relation to the esophagus, stomach, cap, small intestine, and colon.

The first fundamental finding is the contour of the surface of the mucosa as it appears in the silhouette of the lumen of a hollow viscus moderately filled with an opaque meal or air. Alterations in contour due to physiological changes are variable and inconstant. Any organic lesion which projects into the lumen of the gut diminishes the space occupied by the barium and causes what is known as a "killing defect." Any break or abnormal pouching of the mucosa allows the barium mixture to protrude beyond the normal contour of the organ. This protrusion is defined as a crater, niche, or diverticulum. Its appearance in each of the five regions of the gastro-intestinal tract is described.

With regard to the changes to be noted in the cap as related to the first fundamental finding, Cole quotes extensively from an article published by him in 1912 and expresses the opinion that very little can be added from experience gained since then. He cites also a special method for artificial distention of the duodenum which he described in that article.

The discussion of the second fundamental finding deals mainly with changes in the sulcus angularis which divides the body of the stomach from the antrum, the pyloric valve, the ileocecal valve, Houston's valves, and the segmental folds or rings of the colon. The last are described at some length, chiefly to refute the commonly accepted theory that haustra are produced by adaptation of the length of the gut to the three shorter bands or *trunci coli* which run along the colon. The effect upon the segmental rings of the extensive waves of contraction which move forward a large amount of the contents of the colon, as observed roentgenographically, gives a great deal of information regarding the nature of the segmental rings. An extensive contraction of the muscularis propria does not completely obliterate them. The independence of the segmental folds as regards the contraction of the muscularis propria is evidenced also by the fact that a long segment of the colon may temporarily contract without disturbing their arrangement. During a period of contraction of a long segment of the colon the contour of the gut does not remain constant although the gross outline retains the same general form. At the actively contracting end of a long contraction causing a mass movement the mucosa and segmental folds are thrown forward ahead of the contraction wave. The authors believe that these folds act functionally to break up the fecal contents of the colon into variable segments so that the mucosa is brought into contact with different parts of the fecal material, and that

they do not have any function in moving the contents of the colon from one region to another

The third fundamental, the pliability of the mucosa to peristalsis, requires serial roentgenography for its demonstration in early lesions and the presence of peristaltic contractions which are repeated at sufficiently frequent intervals for roentgenographic records to show whether they pass through a certain section of the gut in a normal manner or are obstructed by an area of infiltration which has rendered the wall of the gut non-pliable. Information obtained from this finding made it possible to diagnose a case of gastric carcinoma so early that microscopic section of the excised segment was necessary to confirm the diagnosis. This case is reported in detail with the pathological report of Ewing regarding it.

ADOLPH HARTUNG, M D

Ferguson, A N Chronic Gastric Ulcers. Histological Observations on the Factors Underlying the Healing of Lesions Produced Experimentally in Rabbits. *Arch Int Med*, 1932, xlx, 846

In previous experiments carried out on rabbits Ferguson found that gastric ulcers could be produced by resecting a circular piece of gastric mucosa at least 1.5 cm in diameter through an incision in the serosa and muscularis. The incision was later resutured. Lesions varying in age from three to twenty-four months and representing all stages of ulceration were studied. Almost completely healed ulcers were recognized from the ray-like arrangement of small rugae about them, the roughened and slightly depressed surface of the regenerated epithelium of the mucosa, and their whitish appearance in contrast to the surrounding darker mucosa. The whole lesion had a distinctly puckered appearance. The mucosa just peripheral to its margin, especially in the more chronic lesions, was thrown up into many small irregular elevations.

Even though the ulcer tends to remain chronic its size as compared with the original lesion is considerably decreased. The age factor is relatively unimportant. Some lesions tend to heal in a few months while others persist even after two years. The essential factor determining the rate of healing is apparently the relative balance between the destructive and reparative factors.

In the different specimens studied the degree of healing varied greatly. The microscopic findings depended upon the degree of healing and the character of the base of the ulcer irrespective of the age of the lesion. In a chronic ulcer all layers of the stomach gradually increase in thickness as the margins are approached. The mucosa shows folds instead of the usual regular glandular arrangement. The largest folds border and lean toward the crater of the ulcer. Parietal and serous chief cells gradually disappear as the margin is approached, the last folds being composed entirely of foveolar cells. Finally, only a narrow rim of flattened cells extends for the distance of a few cell-breadths on the surface of the ulcer. These foveolar cells are responsible for

regeneration of the mucosa. Connective tissue elements between the glands forming this epithelium are increased over the usual amount, and there is some infiltration of leucocytes, eosinophiles, and plasma cells.

As the deeper layers of the stomach wall increase in thickness toward the margin of the ulcer, the submucosa decreases until it finally disappears. At the same time the smooth muscle fibers diminish in the muscularis and a compensatory amount of connective tissue appears until the wall is composed entirely of a mass of connective tissue which continues into the base of the ulcer. The base of the ulcer consists of a superficial layer of cell debris which may be called the "necrotic layer" and rests on an underlying layer of connective tissue of fibroblasts containing many blood vessels.

In the healing ulcer the mucosa is composed of foveolar cells and mucous chief cells arranged in small irregular glands with connective tissue between them. Below this layer is a mass of intermingled connective tissue and smooth muscle fibers. There is no distinct muscularis mucosae and no submucosa.

The two main factors involved in the healing of a chronic ulcer are the marginal epithelium and the base. The epithelium attempts to cover the base either by mass proliferation which crowds the entire margin out onto the floor of the base or by regeneration of the marginal cells of new epithelium which creep out over the floor. The foveolar cells stand at the margin of the ulcer waiting for an opportunity to extend out over the floor and cover it. If destruction exceeds the reparative process the base consisting of necrotic tissue, is large enough to prevent the waiting epithelium at the margin from growing out onto the floor of the ulcer. However, if reparative processes are in the ascendancy, the floor provided is such that the epithelium at the margin is able to gain a foothold and advance the regeneration. The extent of healing depends upon the amount of these reparative processes.

SAMUEL J FOGELSON, M D

Vidgoff, I J Acute Intestinal Obstruction at the Los Angeles Hospital. *Ann Surg*, 1932, lxcv, 801

Very little progress has been made in the last forty years in reducing the mortality of acute intestinal obstruction, the average mortality still being between 40 and 60 per cent. Of 266 patients whose cases are reviewed by Vidgoff, 90 per cent were admitted to the hospital after the symptoms had begun and 10 per cent developed intestinal obstruction while they were under observation in the hospital. In the latter group the mortality was 10 per cent higher than the general average of 45.9 per cent.

The symptoms depend upon the portion of bowel involved. The higher the obstruction the more severe are the symptoms and the graver is the prognosis. Obstruction of the small bowel causes paroxysmal, cramping, or cutting pains with vigorous



peristalsis. In obstruction of the large bowel the pain is less severe and more constant.

Vomiting occurred in 95 per cent of the cases reviewed, constipation in 60 per cent and distention in 45 per cent. In the majority, fever and rigidity of the abdominal muscles were absent. Leucopenia was usually found. Sixty-eight per cent of the patients had had previous operations. Of 104 cases in which a roentgen examination was made, the findings by the flat-plate method were positive in 71 per cent.

The types of obstruction and the number of cases and mortality of each type are shown in the following table.

Type	Cases	Mortality %
Abscesses	70	37.6
Hernia	49	60.0
Cancer	3	66.0
Gall stones	4	63.0
Intussusception		0.0
Valvulae of sigmoid	4	75.0
Mackel's diverticulum		100.0
Diverticulitis		0.0

CHARLES F. DU BOIS, M.D.

Betz, O: The Recognition of Intestinal Phlegmon (Der Kenntnis der Darmphegmonen) *Arch f Klin Chir* 93: 1212, 93.

In the last few years four cases of intestinal phlegmon have been observed in the Municipal Hospital of Vienna. Only one ran a course like that described in the textbooks. In the first case gastro-intestinal disturbances had been present for months, and three days before the patient was admitted to the hospital nausea and obstipation began. The temperature, however, remained normal. Anatomical examination revealed an inflammatory tumor the size of a hazel nut at the attachment of the mesentery to the ileum. Microscopic examination disclosed an acute suppurative inflammation. The author emphasizes that the course of the condition was afebrile. The patient was a woman seventy-three years old.

In the second case the condition occurred in a man twenty-two years of age and persisted for eight weeks without fever or stormy symptoms. During the period of four weeks the patient was under observation in the ward, ileus-like manifestations appeared twice. At operation, a fist-sized tumor of the caecum was found and resected with 3 cm. of ileum. Histological examination revealed a small abscess in the wall near the base of the appendix and collections of polymorphonuclear leucocytes and round cells in all of the layers of the wall. In three places there were gland-like accumulations of bacteria, cocci and threads, but these did not possess the club-like enlargements of actinomycetes.

In the third case, that of an alcohol addict fifty-five years of age, symptoms had been noted for months, but constipation and meteorism had been present for only fourteen days. For three days there had been tramp-like pain, nausea, and belching.

As in Case 1 ileus was suspected, but operation revealed enormous distention of the caecum and marked changes in the cecal wall. There were no inflammatory changes in the appendix.

The fourth case was that of a woman forty-five years of age. In this case the condition was preceded by angina with high fever. A diagnosis of perityphlitic abscess was made. At operation the caecum was found markedly thickened, oedematous, covered with a fibrous thins, and adherent to the anterior abdominal wall and the omentum. The appendix was not involved in the inflammatory process. Hemolytic streptococci and colon bacilli were cultured from the tonsils and a pure culture of colon bacilli was obtained from the intestinal phlegmon. The author is of the opinion that the streptococcal infection of the tonsils favored the development of the infection by the bacillus coli.

The first patient died from pulmonary embolism after her discharge. The second was discharged cured. In Case 3 death occurred four days after the operation, and autopsy disclosed a circumscribed peritonitis, paralytic ileus, a large splenic tumor, and parenchymatous degeneration of the heart, liver and kidneys.

In Cases 1 and 2 the diseased portion of bowel was resected. In Case 3, it was exteriorized. In Case 4, it was walled off from the abdominal cavity with gauze and a drainage tube.

In the author's opinion, the only treatment offering any hope is resection.

With regard to the etiology he states that in his opinion a traumatic insult to the intestinal mucosa was responsible for the condition in only a few of the cases reported in the literature. He believes that the chief factor is a change in the resistance of the organs resulting from external or internal causes.

W. KUNZ, (2).

Fossel, A: An Operatively Cured Intestinal Phlegmon (Unter einer Fall von operativ gebiltem Darmphegmonen) *Zentralbl f Chir* 1932, p. 1046.

The case reported was that of a man thirty-two years of age. While the patient was in the army during the war he suffered an attack of gastro-intestinal catarrh. In 1915 he had typhoid fever and since then had had a constant gastro-intestinal disturbance manifested by intermittent attacks of vomiting and diarrhoea. In 1918 he was examined at the Wenckebach clinic, where a diagnosis of colitis was made. X-ray examination disclosed a constriction of the colon in the left lower quadrant. In April, 1931 the trouble became worse, and on May 16 1931 operation was performed following a diagnosis of peritonitis from perforation of the appendix.

The operation revealed extensive peritonitis and a tumor the size of a small fist which was composed of the altered caecum and the lower part of the ileum. The caecum was thickened but soft. The ileum was transformed into a rigid tube with small subserous abscesses. The affected portions of in-

testine were sharply delineated from the normal portions. The appendix was inflamed, but was not perforated. It was removed. The involved portion of intestine was then exteriorized, fastened extraperitoneally, and drained through a Paul-Mixer tube. A month later an ileotransversostomy was done, and three months later the exteriorized portion of bowel was removed.

The extirpated appendix was examined histologically at three levels. Its distal end was found closed by a cicatricial process. In the subserosa and muscularis there was an infiltration of small cells, chiefly lymphoid cells. In the proximal section examination revealed pus, total destruction of the mucosa, and the presence of leucocytes and lymphocytes in the submucosa. The intestine presented all the evidences of a subsided severe phlegmonous process resulting in extensive cicatrization. The active inflammatory process had left round-cell infiltrations and patches of granulations. The muscularis mucosae was markedly thickened. The epithelium covered the vascular cicatricial stroma often by a single layer of cells. The phlegmonous process revealed at operation had healed with pronounced scar formation in the course of five months.

The author concludes that the inflammatory process in the appendix was not the cause of the intestinal phlegmon. This conclusion is supported by the following facts:

- 1 The changes in the appendix were considerably older than those in the intestine.
- 2 The appendix was turned back upward behind the cecum.
- 3 Appendicitis is very common whereas intestinal phlegmon is very rare.

As in most cases, the cause of the phlegmon in this case remains unknown. The diagnosis was not made before operation because characteristic symptoms were absent. W. MANDEL (Z)

Raiford, T. S. Tumors of the Small Intestine  
*Arch Surg*, 1932, xxv, 122, 321

The purpose of this article is to summarize the cases of tumors of the small intestine recorded in the Johns Hopkins Hospital, Baltimore, and to discuss the occurrence, clinical features, and histopathological structure of such neoplasms.

A search of all available material revealed 88 tumors of the small intestine. The material included the records of 11,500 autopsies in the general pathological department and 45,000 specimens from the surgical pathological department. A large percentage of the latter were specimens sent from other hospitals for diagnosis. Tumors of all types in the small intestine constituted 8.0 per cent of all gastrointestinal tumors. Benign tumors in the small intestine constituted 23.8 per cent of all benign tumors and malignant tumors only 4.9 per cent of all malignant tumors, of the gastro-intestinal tract.

Attention is called to the embryological, anatomical, and physiological differences between the small

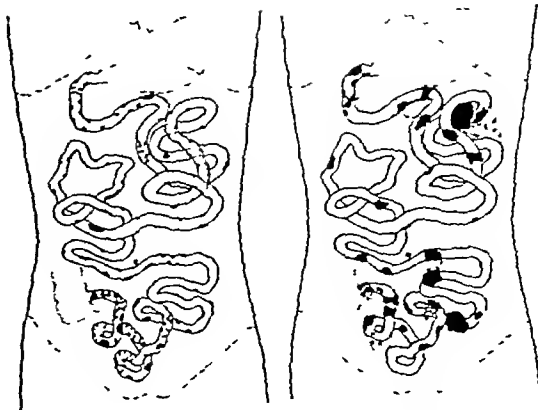


Fig 1

Fig 2

Fig 1 Diagrammatic representation of the distribution of benign tumors in the small intestine. Note the predominance of the polypoid form and the frequency of localization in the lower ileum.

Fig 2 Diagrammatic representation of the distribution of malignant tumors in the small intestine. Metastases are denoted by small dots in the lines radiating from the intestine. The tumors are larger and more invasive than the benign tumors and occur with greatest frequency in the duodenum and lower ileum.

intestine and the stomach and large intestine, and the suggestion made that these may account for the insusceptibility of the small intestine to tumor invasion. Raiford believes that the relative freedom of the small intestine from stasis may be regarded as significant. The only part in which the fecal contents are brought to a standstill and accumulate before passing onward is the terminal ileum, and it is in this region that tumors occur most frequently. Stasis is known to be conducive to irritation.

Tumors of the lymphoblastoma group were found to be most common, numbering 21. Eighteen of them were located in the ileum. Next in frequency were carcinomata, of which there were 16. Eight of the latter occurred in the duodenum, 4 in the jejunum, and 3 in the ileum. Third most common were adenomata, of which there were 15. Eleven were located in the ileum. Of 7 argentaffin tumors, 5 were in the ileum, 1 was in the duodenum, and 1 was in the jejunum. Other important benign tumors of the small intestine are lipomata, tumors formed by accessory pancreatic tissue, and fibromata. The distribution of benign and malignant tumors in the small intestine is shown in the diagrams.

Malignant tumors are larger than benign tumors and usually single. They frequently involve the glands or extend to the mesentery. Benign growths are often multiple and usually polypoid.

#### GENERAL TYPES OF TUMOR GROWTH

Raiford classifies tumors of the small intestine as intraluminal or internal and extraluminal or external. Those of the external type are comparatively

rare. Of the tumors reviewed, they constituted only 5 per cent. The factors determining the direction of growth of tumors of the small intestine are the point of origin of the neoplasm and the free space present. Malignant tumors with a predisposition to extension usually grow out into and along the mesentery. The vast majority of intestinal tumors, especially those which are benign, are of the internal type. Tumors of this type vary widely in form and may be classified as polypoid, sessile and extensive.

Polypoid tumors are commonly benign, but may undergo secondary malignant change. They are frequently described as intestinal polyps, but the majority are adenomata. When a pedicle is formed they are often responsible for intussusception. Polyps rarely attain a size larger than that of a walnut before they cause symptoms of obstruction. Multiple polyps are not infrequent.

Sessile tumors are round or oval and of varying thickness. They may be within the wall of the intestine or attached to the wall by a broad base. They are usually covered loosely by mucous membrane. Undoubtedly they may become polypoid. A polypoid form is usually assumed by benign tumors, but malignant tumors may be sessile before the process of invasion has extended to the surrounding tissues. The mucous membrane is intact unless it becomes eroded by constant pressure of the intestinal contents.

Infiltrative growths, which are usually malignant, originate in the wall of the intestine and extend rapidly either around the lumen or in a longitudinal direction.

The constricting type of tumor is a variant of the infiltrative form but is so dense and frequent as to deserve separate consideration. It is the result of a malignant infiltrating growth that encircles the lumen of the bowel. In some instances the constriction is so great that a thin distorted tubule is all that remains of the intestinal lumen. Growth of this type occurs with surprising frequency in the lymphoblastomata and may prove of aid in the diagnosis of malignancy in such tumors. Some of these tumors show a tendency toward necrosis and excavation, becoming hollow irregular spheres through which the intestinal lumen passes with a constriction at its points of entrance and exit. At operation the necrotic center is often diagnosed as an abscess. Its nature not being revealed until frozen sections are made.

#### MALIGNANT TUMORS

**Carcinoma.** Carcinomata of the small intestine constitute between 3 and 10 per cent of all gastrointestinal carcinomata. They are most common in persons in the fifth and sixth decades of life. The average age of the 16 patients whose cases are reviewed by the author was fifty-two years. The oldest patient was sixty-eight and the youngest thirty-three years old. Carcinomata of the small intestine is most common in males and twice as frequent in the white race as in the colored race. The parts of the small intestine most frequently involved are the du-

odenum, and the terminal ileum. Of the 16 carcinomata reviewed, 7 occurred in the second portion of the duodenum. In 4 of the cases metastases were found. The first site of metastasis is the mesenteric glands. The next most common sites are the peritoneum, liver and lungs, but extension beyond the mesenteric glands is rare. Given in the order of their frequency the gross forms assumed by carcinomata of the small intestine are the constricting type, the infiltrating ulcerative type and the polypoid type. The size of the neoplasms is exceedingly variable. The smallest of the neoplasms reviewed were tiny submucous nodules a few millimeters in diameter which appeared benign until histological sections were examined. The largest was an infiltrating, ramifying lesion the size of a grapefruit, which involved the surrounding structures. Carcinomata of the external type are rare, but are the largest because they do not produce early symptoms. The polypoid tumors rarely grow larger than a hen's egg before symptoms of obstruction reveal their presence. They are a pearly white and of a firm, hard consistency. They cut like cartilage. The cut surface is a bluish-white and looks fibrous. The author describes the 4 main types of carcinomata occurring in the gastrointestinal tract—adenocarcinoma and medullary, scirrhus, and colloid carcinoma.

**Sarcoma.** Sarcomata of the small intestine are rare and are practically of the same character as those found in the stomach and large intestine. In the material reviewed there were 2. One was of the spindle-cell variety and the other was a myosarcoma. Both of the patients were in the fifth decade of life. Sarcomata occur most frequently in the ileum. They do not metastasize so readily as carcinomata. Metastasis occurs most frequently in the mesenteric glands. From there, secondary invasion may reach the liver and lungs. Sarcomata tend to assume the external form, growing out into the mesentery rather than into the lumen of the intestine. The gross form is usually rounded, lobulated, and encapsulated. In contrast to the finger-like ramifications shown by the advancing border of a carcinoma. At first, sarcomata are usually hard and elastic. In the more advanced stages they may have a soft spongy feeling if central necrosis has occurred. The cut section is white and translucent. The tumors vary in size, but often attain that of a child's head. Railroad describes the findings of microscopic examination of a fibrosarcoma, a myosarcoma and a myxosarcoma. Sarcomata have a better prognosis than carcinomata because they metastasize less frequently, grow more slowly and do not tend to break away from the circumscribed form early in their growth. When they are excised early they do not tend to recur and complete recovery may result.

**Lymphoblastomata.** With regard to the lymphoblastomata the author states that there is a great deal of confusion in the nomenclature and classification. The small intestine seems peculiarly susceptible to tumors of this type, being involved by them about twice as frequently as the large intestine. The

neoplasms may occur at any age, but are far more frequent in young persons than other malignant tumors. The average age of the 21 patients whose cases are reviewed was thirty-two years. The youngest patient was five years and the oldest seventy-seven years old. Sixteen of the patients were males and 5 were females. Eighteen were whites and 3 were negroes.

Lymphoblastomata occur most frequently in the terminal ileum. Twenty of the 21 tumors of this type reviewed by the author occurred in the terminal 100 cm. of the ileum and 1 was found in the middle third of the duodenum opposite the papilla of Vater.

Tumors of the lymphoid series do not metastasize as readily as either true sarcomata or carcinomata. When metastasis occurs, the adjacent mesenteric lymph nodes are chiefly involved. Extension beyond these nodes does not follow any regular course. The malignant cells may be transported by the lymph or blood channels or by direct extension.

Lymphoblastomata vary from small thickenings of the wall in the region of the agminate nodules to external tumors the size of a grapefruit. The most common form is that of a constricting growth encircling the intestinal lumen. This is almost characteristic and supports the diagnosis of malignancy in doubtful cases. The growth begins on one side of the wall and extends around the lumen. Extension may proceed also in the longitudinal direction and may be followed by dilatation in the center of the tumor, the final picture being that of a hollow sphere constricting the lumen of the intestine at its points of entry and exit. Extension to the mesentery may also take place, but this is not the rule. The majority of the tumors present a smooth unbroken surface. The tumors of multiple polyposis resemble adenomata in their gross form, but on microscopic examination are found to be lymphoid tumors.

The texture of the tumors in the advancing stage is firm and fibrous, and the cut edge is bluish-white. Central necrosis with excavation is not unusual. When, on incision of the tumor wall, a quantity of purulent necrotic material has escaped, tumors with excavation have been diagnosed as abscesses, and their malignant nature has been recognized only from frozen sections.

The histological picture is subject to the widest variation although certain typical cellular elements are common to all types. The classification used by the author is based in general on the preponderance of these cells and is a modification of Ewing's classification. Raiford describes in detail the 4 main groups, viz (1) non-specific granulomata, (2) reticulum cell sarcomata, (3) malignant lymphocytomata, and (4) endotheliomata.

The histogenesis of the lymphoblastomata as a group is still obscure, but it is assumed that the neoplasms arise from lymphoid tissues as atypical cell types. This assumption is based on the fact that practically all of them are found in the terminal ileum and on the fact that the cells of which they are formed show plainly all gradations from normal

lymphocytes to large malignant tumor cells. The reason for the change is unknown. The best index of malignancy in these tumors is the appearance of the cells. Experience has shown that the reticulum-cell sarcoma is the most malignant of the group. Raiford believes that lymphoblastomata must be considered potentially malignant until the clinical course proves them benign.

#### BENIGN TUMORS

*Adenomata* The most common benign tumor found in the small intestine is the adenoma. This neoplasm seldom attains a size sufficient to cause symptoms of obstruction. The majority of the 15 adenomata reviewed by the author were recognized only at autopsy. The youngest patient with an adenoma was six months old and the oldest sixty-two years of age. Symptomatic adenomata tend to occur in younger persons. Adenomata occur with equal frequency in all races and in both sexes. They increase in frequency toward the lower part of the intestinal tract. It is generally agreed that in the jejunum they are extremely rare. In their gross pathological structure, they are similar to the majority of benign tumors. They constitute a large percentage of the group classed as polyps and papillomata although not infrequently they are sessile, especially in the early stages. They usually occur singly, but may be multiple, and they vary in size from tiny filiform threads with the diameter of a pinhead to tumors as large as an English walnut. On the basis of the clinical symptoms alone, multiple polyposis is frequently indistinguishable from colitis. The gross appearance differs very little from that of other types of polyps. The mucous membrane is usually intact, hyperæmic, and fungating in appearance. On section, the tumors are found to be mushroom-like masses with a central white fibrous stalk leading up from the intestinal wall and ramifying between soft friable masses of glandular tissue lying at the periphery. The glandular elements of a typical adenoma show 2 types of cellular development. Near the pedicle there is less proliferation, but approaching the periphery the cells become more carelessly arranged. The connective tissue stroma is composed of ramifications of the pedicle between the glandular elements of the tumor. Well-formed blood vessels are found in the pedicle. Toward the periphery the stroma consists of fibroblasts and spindle cells and is much more cellular than at the base of the pedicle. As the tumor grows older the differences in the cellular elements in the pedicle and at the periphery of the tumor become more marked. The theory that the neoplasms are due to inflammation and the theory attributing them to a primary epithelial change are plausible. The author reviews the development of adenomata as described by Saint. On microscopic examination, the diagnosis of adenoma offers no difficulty.

*Miomata* Miomata of the small intestine occur with sufficient frequency to warrant their consideration as a pathological entity. They are most com-

moon in the fifth decade of life, but have been found in persons as young as thirteen and as old as sixty-eight years. They occur more frequently in males than in females. They are most common in the ileum. Their gross pathological structure differs very little from that of other benign growths. They vary in size from that of a pea to that of a child's head, and grow internally or externally. When they are internal they are usually sessile, although the polypoid form is not rare. In consistency they are firm and rubbery. Those of the internal type are usually a deep red externally and bluish-gray on section. The characteristic histological picture is that of benign hypertrophy of muscle fibers with an added overgrowth of fibrous connective tissue. The cellular elements consist of smooth muscle cells rather larger but shorter and more rounded than normal. The center of the tumor is frequently fibrous and grows faster than the periphery. The most common regressive change is hyaline degeneration. Occasionally calcification occurs within the tumor. The growth of the tumor is expansive and associated with hypertrophy of the fibrous stroma. Some myomata become malignant.

**Fibromata.** Pure fibromata are among the rarest tumors found in the small bowel. The mixed forms are much more common. Fibromata occur usually in advanced age. Of the patients whose cases are reviewed by the author the youngest was fifty-two years and the oldest sixty-nine years of age. The neoplasm occurs most frequently in the ileum. There is nothing characteristic about the gross form. The tumors may grow internally as sessile or pedunculated neoplasms or extend out into the mesentery, retroperitoneally or may be free in the peritoneal cavity as external tumors. They are round or oval, discrete, circumscribed, and freely movable. In consistency they are firm and rubbery. The cut section is a grayish white. Microscopic sections show the bulk of the tumor to consist of hypertrophied and hyperplastic connective tissue. The neoplasm is relatively poor in cellular elements. Elastic fibers predominate. Among them spindle cells and stellate fibroblasts are found. At the periphery there is a moderate admixture of small round cells, plasma, and red blood cells. Areas of myxomatous degeneration are not uncommon. Fibromata arise from connective tissue cells. It may be difficult to differentiate fibromata, myomata, and the mixed forms and to determine which tissue predominates. The origin of the myxomatous tissue is questionable.

**Argemone tumors.** The peculiar argemone or cardoid tumor has aroused considerable discussion in recent years. The clinical features of neoplasms of this type are insignificant. The tumors rarely attain a size sufficient to cause symptoms and are seldom recognized before autopsy following death from some other condition. The majority are located in the ileum. Of the 7 reviewed in this article, 5 were in the ileum, 1 was in the jejunum, and 1 was in the duodenum. The tumors are frequently found in the appendix. Cardiacoids are commonly thought

to be benign tumors, but there are records of cases in which metastases occurred and a diagnosis of malignancy was made on this basis. One of the neoplasms reviewed was found on microscopic examination to be benign, but metastases had occurred to the liver and lymph nodes. The gross pathological findings are not characteristic. The neoplasms are seldom more than 1 cm. in diameter and usually are the size of a pea. They may be sessile within the intestinal wall, or attached to a small pedicle. They are usually single, but may occur in groups of 2 or more. On section, they are found to be soft, elastic, and yellow. The characteristic microscopic picture shows nests and strands of cells surrounded by a fairly definite limiting membrane and separated by a stroma which varies in amount. The cells are small, relatively uniform, and round or oval. Pressure near the edges of the cell nests may cause them to assume a spindle shape. Rarely the cells assume an acinar formation, but the usual picture is that of solid sheets of cells. Much remains to be determined regarding the histogenesis of the tumors. The theory that the neoplasms arise from pancreatic rests has had many adherents. Ewing claims these rests to be a type of cardoid, but the author believes that the microscopic picture is definitely different. The resemblance to basal-celled epitheliomata of the skin is striking.

**Absent pancreatic rests.** The aberrant pancreatic rest is a type of benign tumor growth which is of minor clinical significance. It rarely produces clinical symptoms and is seldom found except at autopsy. In the cases reviewed by the author 3 were found in the duodenum, 3 were in the upper part of the jejunum, and 1 was near the midportion of the ileum. As a rule the neoplasms appear grossly as small submucous nodules which are rarely more than 1 cm. in diameter. They are irregular, discolored, flattened, or oval. Occasionally they are of sufficient size to cause obstruction. One of the 6 reviewed by the author produced an intussusception of the ileum. The tissue is soft and spongy and is freely movable beneath the mucous membrane. The cut section is grayish-white. Throughout the tumor can be seen irregular patches of denser tissue representing the pancreatic tissue. Except from the standpoint of distribution, the microscopic picture of pancreatic rests is the same as that of normal pancreatic tissue. The aberrant tissue may be found scattered throughout the intestinal wall, but the largest accumulations are usually discovered in the submucosa. One of the differences between the normal organ and aberrant tissue is the occasional absence of normal islands of Langerhans in the latter. Observing the proximity of the ventral pancreatic bud in the embryo to the primitive yolk stalk, Simpson concluded that small buds might easily become detached at this point and be carried in either direction by the later development of the latter structure. In the author's opinion this is the most plausible theory. The possibility of a relation of aberrant pancreatic tissue to diverticula has been suggested, but has not been proved.

*Angiomata* Angiomata of the small intestine are very rare. Among the tumors reviewed by the author there were only 3. The neoplasms are of 2 types—*hæmangioma*, arising from the vascular system, and *chylangioma*, arising from the lymphatic system. The clinical features are insignificant. *Hæmangioma* are of the simple and cavernous types. *Chylangioma* show the same types and, in addition, a more dilated or cystic form. In a large number of cases the tumors are multiple. *Hæmangioma* are small, reddish, submucous nodules rarely more than 1 cm in diameter. *Chylangioma* are grayish-yellow or yellow and softer. When *chylangioma* are squeezed, a clear yellow or milky fluid is expressed. The characteristic microscopic finding in simple *hæmangioma* is an overgrowth of blood vessels. *Chylangioma* are very similar in appearance. The histogenesis of the angiomata remains confused.

*Hæmatomata* are not true tumor growths. They are extremely rare and apparently of purely mechanical origin. They are of little clinical importance unless the extravasation is sufficiently large to cause partial occlusion of the intestinal lumen. This was the condition in 1 of the cases reviewed by the author.

*Lipomata* *Lipomata* are soft yellow nodules. They are not infrequently found in the small intestine at autopsy. They seldom cause symptoms. Of the tumors reviewed by the author, 7 were *lipomata*. The growth of *lipomata* is very slow. The tumors are attached to the intestine by a long pedicle. Frequently the pedicle is broken and the tumor is passed by rectum. Some *lipomata* become large and, if internal, may produce intussusception. When external, they may attain the size of a child's head. *Lipomata* are evenly distributed throughout the intestine. As a rule they occur singly, but not infrequently from 6 to 8 tumors are found. The majority are internal. Microscopically, *lipomata* of the small intestine resemble *lipomata* found elsewhere in the body. Their cause is unknown. They are sessile in the early stages, but tend to become pedunculated as they grow older.

#### RARE TUMORS

*Enterocysts* Among the rarer intestinal tumors, are cysts. These are exceedingly rare. The 1 tumor of this type among the neoplasms reviewed by the author occurred in the duodenum of a child three days old. *Enterocysts* occur most frequently in the ileum near Meckel's diverticulum. The gross pathological process is variable. The cysts may be multiple or single. They are rarely larger than a walnut, but some as large as a man's head have been reported. In the ileum they tend to be external, but internal cysts are not unknown. Elsewhere they tend to be internal. Clinically, they are often confused with ovarian cysts. The contents may be mucilaginous, gelatinous, or fluid, and colorless, yellow, or brown. In some cases microscopic examination of the cyst wall shows it to be composed of all of the layers of the intestinal walls. Many varia-

tions of the picture may be seen. The origin and histogenesis of intestinal cysts have been the subjects of much discussion. According to the most generally accepted theory, the cysts are due to incomplete closure of the omphalomesenteric duct in the embryo. Some believe that they are primary in the mesentery and secondary in the intestine.

*Cystic pneumatosis* Cystic pneumatosis is not infrequent. It is of interest primarily from the pathological point of view as it occurs practically only in oriental countries. It is characterized by the appearance of multiple gas-filled cysts on the serous surface of the intestines. Clinically it may suggest appendicitis, peritonitis, or obstruction with distention and tympanites. It is not limited to any one part of the bowel. It appears and subsides spontaneously. As a rule it lasts from a few days to a week. When the abdomen is opened all of the intestines are seen to be covered by grayish-white transparent cysts filled with gas. The cysts vary in size from that of a pin-head to that of an orange. They may be discrete or confluent. Sometimes they resemble a cluster of grapes. The intestinal wall is thickened, boggy, and crepitant to the touch. If pricked, the cysts collapse, leaving thin sacs. In some of the cysts a small amount of purplish fluid has been found in addition to the gas. Microscopic section of the cyst wall may show the presence of the outer layers of the intestine. Malignant degeneration has never been noted. No satisfactory conclusions have been reached regarding the etiology. The gas is not toxic and does not produce peritonitis.

*Neuroblastomata* Only 2 cases of neuroblastoma of the small intestine have been reported in the literature. The origin of the neoplasms is believed to be the chromaffin cells of the autonomic nervous system, but the etiology and development are obscure. *Neuroblastomata* are definitely invasive. They grow through all of the coats of the intestine. They are irregular, and in gross section may suggest carcinomata. Their consistency is firm unless necrosis has begun, when the neoplasms become friable. The color is usually white with a pinkish tint. Ritter's description is cited.

#### SECONDARY TUMORS

Secondary growths in the small intestine simulate primary growths. The most common site of the primary growth is the stomach, and the next most common sites are the pancreas and uterus. In only 5 of the cases reviewed by the author was the primary growth located above the diaphragm. This fact indicated that metastasizing cells are carried largely by the lymphatics. Metastasis occurred in the jejunum only once, whereas the duodenum and ileum were frequently invaded. Secondary invasion is divided approximately equally between extension and metastasis.

#### CLINICAL ASPECTS

A correct pre-operative diagnosis of tumor of the small intestine is seldom made on the basis of the

symptoms and physical signs alone. Roentgenograms are the chief diagnostic aid, but are not infallible. The symptoms and signs are brought about largely by the mechanical condition produced by the tumor and to a lesser degree by the constitutional effects of the tumor. The symptoms of benign and malignant tumors are somewhat similar except when the latter are sufficiently invasive to cause constitutional manifestations. The author discusses the symptoms, physical signs, roentgen observations, diagnosis, treatment and prognosis.

The article concludes with a report of 12 cases illustrating the various types of tumors of the small intestine.

Edw. C. Rowlands, M.D.

Wakley, G. P. G., and Rutherford, R.: Carcinoma of the Cecum. A Discussion of Its Incidence, Diagnosis, and Treatment with a Report of Twenty Five Personal Cases. *Brit. J. Surg.* 93, 22, 9.

If the rectum is excluded, 10 per cent of all cancers of the large intestine occur in the cecum. During the period from 1920 to 1930 inclusive 355 patients with carcinoma of the large bowel exclusive of the rectum were admitted to King's College Hospital, London. Among these there were 31 of primary cancer of the cecum.

The blood supply of the cecum is derived from the artery of the mid-gut, namely the superior mesenteric artery. The vessels concerned are the anterior and posterior cecal arteries, branches of the ileocolic artery, a terminal derivative of the superior mesenteric artery. The blood supply is more readily seen if the cecum is examined from behind. The posterior cecal artery is the larger of the two and gives off the artery to the appendix. It is evident that if an attempt is made to ablate the cecum alone some of the collateral vessels are endangered. These are the ileal branch of the ileocolic artery which supplies the terminal 8 in. of the ileum, and the right colic artery which is responsible for vascularization of the ascending colon and part of the transverse colon. In order to avoid the risk of gangrene, the resection for carcinomas of the cecum must include not only the cecum but also the terminal 8 in. of the ileum, the ascending colon, and the proximal 3 or 4 in. of the transverse colon.

The lymphatic vessels of the cecum follow the vascular channels. The lymphatic glands are grouped as follows: (1) anterior and posterior cecal glands, and (2) appendicular glands, ileal glands, and right colic glands. Any or all of these glands may be involved in cancer of the cecum. It has been estimated that the lymph glands are involved in 35 per cent of cases of cecal cancer.

The youngest patient with cancer of the cecum whose case has been recorded was a girl of fourteen years. As a rule the condition develops in the fifth decade of life or later. In 100 cases reported from the Mayo Clinic the average age was forty nine years. The condition is twice as common in males as in females. If constipation were an important

etiological factor females would have the disease more frequently than males. It is significant that cancer occurs commonly in those parts of the alimentary tract which are developed from the fore- and hind gut. Carcinoma of the small bowel is very rare, constituting only about 3 per cent of all cancers of the intestines. The reaction of the contents of the stomach and large bowel are acid, while that of the small intestine is alkaline. In the stomach cancer is common. It is possible that the mucus lining the outer wall of the cecum is injured by the impingement of the alkaline juices of the small intestine squirted through the ileocecal valve.

Cancer of the cecum varies in its histological type. The most common type of cecal cancer is the adenocarcinoma. In fibrosarcoma, adenitis usually occurs, and infiltration of the muscular wall by atypical cancer cells occurring in groups is a more or less constant feature. Colloid carcinoma, better termed "mucoid degeneration," may occur in adenocarcinoma. In this condition microscopic examination may show loss of all structure. Carcinoma arising from polyp is rare in the cecum.

The cancer begins in the mucous membrane in the outer wall of the cecum opposite the ileocecal valve, usually in the form of an adenocarcinoma. It extends downward to the caecum and later upward toward the ileocecal valve. The ileocecal valve is not involved until comparatively late. The majority of patients present themselves for examination on account of a lump in the right iliac fossa. In some the growth projects into the lumen of the cecum as a large fungating cauliflower-like mass and septic absorption and toxemia associated with leucocytosis may occur. In others, the growth tends to infiltrate the wall and a carcinoma of the peritoneum may result. Ultimately the liver becomes the site of secondary deposits of cancer cells.

The symptoms of cancer of the cecum are very variable and do not conform to any definite type. The most constant feature is the presence of a palpable tumor mass. If the growth finally obstructs the ileocecal valve, symptoms of intestinal obstruction rapidly ensue. Pain is rare, but constipation is common. Anemia of varying degree may be present. Tenderness in the right iliac fossa may lead to diagnosis of appendicitis. The patient seldom complains of nausea. The average duration of the symptoms before operation varies from six months to two years. Blood was found in the stools in only 3 of the cases reviewed by the author. In cases with a palpable mass in the right iliac fossa the condition must be differentiated from ileocecal tuberculosis, appendiceal abscess, and actinomycosis. The chief aid in the differential diagnosis is X-ray examination with the use of a barium meal or barium enema.

Carcinoma of the cecum can be treated satisfactorily only by surgical measures. X-ray and radium therapy are of little value in this condition. The surgical treatment is best carried out by a 2-stage operation. Although surgical excision of the

growth and ileocolostomy have been performed successfully in 1 stage, this is not the safest method. In the correct procedure a lateral anastomosis is made between the transverse colon and the terminal ileum and after an interval of from one week to ten days the terminal ileum cæcum, ascending colon, and about 4 in. of the transverse colon are excised and the posterior surface of the peritoneal cavity is peritonized, the omentum being used for the peritonization if necessary. In cases complicated by intestinal obstruction ileocolostomy should be performed as a preliminary procedure.

The authors report 25 cases of cancer of the cæcum

JOHN W. NUZZO, M.D.

Quénu, J. Bilateral Exclusion of the Large Intestine with Opening of the Two Ends of the Excluded Segment as a Preliminary to Total Colectomy (De l'exclusion bilatérale du gros intestin avec ouverture des deux bouts du segment exclu comme opération préliminaire de la colectomie totale) *Bull et mém Soc nat de chir*, 1932, LVII, 688

The author reports the case of a man thirty-six years of age who had a cancer of the splenic flexure causing obstruction. Histological examination showed the neoplasm to be a cylindrical epithelioma. The first stage of the operation was a simple latero-lateral ileosigmoidostomy performed November 7, 1929. This was not expected to overcome the obstruction of the colon, but was intended to keep it from becoming any worse by allowing the intestinal contents to pass directly from the small intestine into the rectum. After this procedure the patient stopped vomiting and passed gas, and a few days later simple purgatives resulted in a stool. Two weeks later the patient had recovered sufficiently for bilateral exclusion of the entire colon. The two ends of the excluded part were then opened through the skin. The author regards this procedure as the essential part of his operation. The colon was irrigated from both ends. Fluid passed in at one end failed to come out of the other. If only one end had been opened the whole colon would not have been irrigated. Quénu attributes the unfavorable effects of exclusion complained of by most surgeons to the fact that they open only one end of the segment to be resected. In an effort to overcome these poor results they shorten the segment to be resected.

The author's case proves that all of the colon can be resected if the excluded colon is irrigated from both ends. After daily irrigation for two months, total colectomy was performed on January 30, 1930. The patient was in good condition and had gained 11 kgm. Recovery from the colectomy was uneventful. The patient is now still well and able to carry on his work as a fish dealer.

The left colon was opened directly on the skin and the right colon indirectly through a short segment of ileum. The ileostomy was therefore protected by Bauhin's valve which remained constantly continent. As the spleen which was adherent to the

tumor was torn, splenectomy was necessary. The splenectomy had no unfavorable sequelæ. Today, two years after the operation the blood count is practically normal. Lymphocytosis is present, but does not appear to have any special significance.

ALFRED GOSS MORGAN, M.D.

Corachán, M. Inflammatory Strictures of the Rectum (La estenosis rectal inflamatoria) *Arch de med, cirug y especial*, 1932, XIII, 429

Inflammatory rectal stricture is secondary to a pararectal lesion which is principally of lymphatic origin. In most cases it is secondary to a lymphogranulomatosis. It is thus a progressive affection with no tendency toward spontaneous cure. It is often reproduced in the upper segment of the rectosigmoid after complete excision and anastomosis.

Histological study of inflammatory rectal strictures fails to show the dense fibrous tissue formation which might be expected. Connective tissue elements are found in a rather loose meshwork. Scattered throughout the submucosa and the muscular and subserous layers are nodes and strands of densely packed plasmatic cells, a feature which is specific for this lesion. There is also an infiltration of the same type of cells in the pararectal lymph glands. This histological structure is not found in inflammatory strictures in other parts of the body.

Proctitis is not the cause of stricture, but a secondary effect. If we bear in mind that in none of the specific varieties of proctitis—gonorrhœal, tuberculous, or ulcerous—is there a tendency toward stenosis, it appears evident that the mucosal lesion is not primary in the pathogenesis of stricture.

The lesion of the pararectal lymphatic glands probably has its origin in a genital or anorectal infection and in the majority of cases is of the nature of a lymphogranuloma. In the beginning proctitis follows lymphatic stasis and retrograde lymphangitis from the inflamed glands. Perirectal suppuration may result in a similar manner.

Patients suffering from inflammatory stricture of the rectum usually come to the surgeon in such an advanced stage of the condition that the formation of a permanent artificial anus is the only treatment of any avail. Dilatation, cauterization, and rectotomy should not be attempted. The technique of colostomy by the method of Cuneo has been modified so that the patient has considerable muscular control and can easily irrigate the loop of bowel. A flap of skin and subcutaneous tissues is turned upward from the left iliac region and a loop of sigmoid brought out through a gridiron muscular incision. The bowel is cut across and the distal end closed and dropped back into the abdomen. The muscles are closed about the upper portion of sigmoid. This segment is then brought out through a new opening in the skin below by tunneling the subcutaneous tissue. The new skin incision is then closed around the end of the bowel and the original skin flap resutured so that the terminal sigmoid occupies a subcutaneous position.



After colostomy the general condition soon returns to normal and the local ulcerative condition improves. Further treatment of the strictured area must depend upon the extent of the pathological changes present. Plastic resection of the strictured area with an attempt to preserve the sphincters is not advisable. Complete extirpation of the affected rectum should be performed after the infection has subsided. Formerly the combined abdomino-perineal method was employed, but this has now been abandoned for the use of the perineal route alone.

WILLIAM R. MEYER, M.D.

Dukes, C. E.: The Classification of Cancer of the Rectum. *J. Path. & Bacteriol.*, 1932, LXXV 222.

Cases of cancer of the rectum are graded by the author according to the extent of the lesion. Group A is made up of cases in which the growth does not extend beyond the wall of the rectum. Group B of those with extension into the extramural tissue without regional metastases and Group C of those with lymph-node involvement. This report is based on 215 operable cases treated by excision of the rectum.

In the author's procedure the segment of gut removed is sent to the laboratory without opening or fixation. In the laboratory it is opened along the wall opposite the growth, washed with formalin solution, pinned out flat on a large piece of cork and浸 in a 10 per cent formalin solution for two days. This slice is then cut through the tumor from within outward. The firm, yellowish white cancerous tissue is usually seen to have a well-defined boundary. A block of tissue is removed from the region of greatest penetration with equal parts of tumor and apparently normal tissue. The first impression as to the extent of the growth is seldom changed by microscopic examination.

In the beginning, while it is limited to the mucosa and submucosa, cancer of the rectum is a proliferant by epithelial growth with an appearance suggesting its development from an adenoma. Infiltration results in ulceration dependent upon the depth of penetration. The two types of the traditional classification—the projecting and the ulcerating types—represent different stages in the evolution of the growth and not two varieties of tumor. Lymphatic metastases are usually not found until, by coincidence the carcinoma has reached the extramural tissues. Metastases at an earlier stage have been reported, but must be rare as none was found in the 38 cases of Group A reviewed by the author. A complete cure may be obtained if the growth is removed before it penetrates the rectal wall. The only generalization possible at present is that cases of projecting tumors without fixation of the rectum probably belong to Group A or B and those of deeply ulcerated lesions almost certainly belong to Group C. There is no relation between the surface area and the depth of penetration.

Of the 215 cases reviewed, 18 per cent belonged to Group A, 35 per cent to Group B and 47 per cent to Group C. In the cases belonging to Group A there

have been only 3 deaths and these were due to a cause other than carcinoma. The findings of the follow-up in the cases reviewed justify the prognosis of a complete cure in cases of Group A and a good prognosis in those of Group B. In cases of Group C, surgical treatment has been disappointing.

The report for 1927 of the Ministry of Health as cancer of the rectum says that the average survival period up to the end of five years after excision was two and fifty-three hundredths years. The estimated survival in untreated cases is one and fifty-six hundredths years. It remains to be seen whether excision in cases belonging to Group C will be followed by longer survival. The majority of cancers of the rectum are adenocarcinomas. Colloid cancer is uncommon to the rectum, and sarcoma cancer is rare.

Dukes has compared the grading of his cases with histological grading by Broder's method. By Broder's method, tumors are graded according to the degree of cellular differentiation, as cells that are well differentiated have less power of reproduction. In tumors of Grade 2, from 75 to 100 per cent of the cells are differentiated, in those of Grade 3, from 50 to 75 per cent, in those of Grade 4, from 25 to 50 per cent, and in those of Grade 5, from 0 to 25 per cent. In using this grading as a basis for prognosis in rectal cancer Broders and Rankin found that the best results were obtained in cases of Grade 2 and very poor results in those of Grade 4. The arrangement and differentiation are not uniform throughout the growth, the cells being less differentiated in the area of invasion than in the surface layer.

The conclusion reached was that cellular differentiation is of definite value for prognosis as all of the patients with lesions of Grade 2 were alive after three years and most of those with lesions of Grade 3 was dead. However from 50 to 60 per cent of cancers of the rectum are of Grade 2, in which the prognosis is favorable. The differentiation must be judged from a study of the tumor as a whole and not from a single microscopic field.

In the author's opinion classification according to the extent of the growth is a more reliable aid in the prognosis than the degree of cellular differentiation because if a highly malignant growth is removed before it has reached the extramural tissue and before metastasis has occurred the patient has a much better chance of recovery than if he had a lesion of Grade 2 which had progressed to the stage of metastasis.

E. E. FLATT, M.D.

#### LIVER, GALL BLADDER, PANCREAS AND SPLEEN

Finsterer: The Value of Cholecholecystostomy in the Treatment of Suppurative Cholangitis and the Liver of Biliary Stricture (Über den Wert der Cholecholecystostomie bei der Behandlung der strittigen cholangitis und der Gallenstricturen). *St. T. u. Deutsch. Ges. f. Chir. Berlin*, 1932.

In the treatment of suppurative cholangitis with or without occlusion by stone provision must be

made for an unobstructed outflow of the pus and bile after removal of the obstruction. For this purpose drainage of the hepatic duct, dilatation and stretching of the papilla, and choledochoduodenostomy are available. Of the 524 cases in which the author has operated upon the biliary tract, obstruction of the common duct by a stone or cholangitis was found in 89. In 56 of the latter an external choledochoduodenostomy was performed, in 4, a transduodenal choledochoduodenostomy, in 11 suture of the common duct, and in 18, drainage of the hepatic duct. Of 42 cases of purulent cholangitis, obstruction by stone was present in 40. In 32 cases in which external choledochoduodenostomy was done there was 1 death from peritonitis caused by leakage due to inadequate drainage at operation. In another case the patient died from sepsis which was present before the operation. This was a case of complete obstruction of the common duct of five months' duration in which there was a high fever, and streptococci were found in the blood. Death was the consequence of too prolonged medical treatment.

From the standpoint of the severity of the condition and the ages of the patients, the mortality of from 31 to 62 per cent was relatively low. High fever with obstruction of the common duct was present in 8 cases for two to four weeks, in 4 cases for two months, in 6 cases, for three months, in 6 cases, for four months, in 4 cases, for six months, in 1 case, for seven months, and in 1 case, for nine months. Five patients were between forty and forty-nine years of age, 12, between fifty and fifty-nine, 11, between sixty and sixty-nine, and 4, between seventy and seventy-seven.

Transduodenal choledochoduodenostomy was done in 2 cases in which stones were impacted in the papilla. One of the patients was cured and the other died of pancreatitis which was present before the operation.

In 8 cases of hepatic duct drainage in young patients (2 under forty years of age, 4 between forty-one and fifty years old, 1 fifty-eight years old, and 1 sixty-four years old) with obstruction of the common duct of short duration (two to four weeks in 6, six weeks in 1, and eight weeks in 1) there were 3 deaths due, respectively, to subphrenic abscess, cholæmic hæmorrhage, and cardiac failure brought about by pancreatitis or the anæsthetic.

Because of the severe liver damage associated with the disease, further damage from ether anæsthesia must be avoided. The author almost always operated under paravertebral or splanchnic anæsthesia. To regulate the flow of bile, decholin was injected intravenously.

In spite of the severity of the cases, the late results were very good. The liver swelling rapidly subsided, the general condition became good, and there was a considerable gain in weight. Of 18 patients operated upon from three to nine years previously, 15 were found alive and free from complaints. Two died entirely free from complaints referable to their previ-

ous trouble. One of the latter, a woman eighty-three years old, died from apoplexy after six years. The other, a man seventy-four years old, died from influenza pneumonia after three and a half years. In the case of a woman fifty-seven years old recurrence of the symptoms three and a half years after operation was explained at laparotomy by a carcinoma of the pancreas which was encroaching on the duodenum. Temporary improvement followed gastroenterostomy.

The author concludes that external choledochoduodenostomy is thoroughly justified also in suppurative cholangitis. He prefers it to hepatic duct drainage. He believes that hepatic duct drainage is to be considered only when the associated obstruction of the common duct has been of short duration and the wall of the duct is still thin. When it is followed by persistent or recurring complaints, choledochoduodenostomy must be performed at a second operation.

STETTINER (Z)

Bachy, M. G. A Study of Cholelithiasis Based on a Personal Series of 145 Cases (Étude de la lithase biliaire d'après une statistique personnelle de 145 cas). *Rev. de chir.*, Par., 1932, li, 229.

In an article of 177 pages the author reviews his experience in 145 cases of cholelithiasis and compares these cases with a similar series which were reported in 1913.

He states that in early mild cases treatment with urotropin sodium benzoate, and sodium salicylate and regulation of the diet often relieves the symptoms. In true calculous cholecystitis, indefinite delay of operation exposes the patient to the dangers of perforation, peritonitis, ileus, and malignancy.

Ileus from the impaction of a stone in the intestine is a more common accident than is generally supposed and usually has a high mortality. In a case reported by the author the duodenum was obstructed.

Peritonitis results from propagation of the infection through the wall of the gall bladder, perforation of the gall bladder, or inundation of the peritoneum by a mixture of bile and pancreatic juice without the occurrence of perforation. The cause is usually a stone lodged in the ampulla of Vater. Peritonitis in the absence of perforation can be cured in a fair proportion of cases by early operation. Cholecystectomy is preferred to simple drainage. Perforation of the gall bladder is extremely grave. With cholecystectomy and drainage the author obtained 2 recoveries in 10 cases. The recoveries occurred in cases which were treated within the first twenty-four hours.

Cancer of the gall bladder is never operable. Its frequency is a strong argument for early operation in cholelithiasis.

Of 12 emergency cholecystectomies, 10 were followed by recovery and of 6 cholecystostomies, 5 were followed by recovery. All were performed in cases of advanced acute cholecystitis. The author favors removal of the gall bladder, especially when

the wall shows plaques of necrosis. He reserves drainage for patients of advanced age or with low resistance. It may be performed under local anesthesia.

In a long discussion of chronic cholecystitis the author says that in the presence of a biliary fistula X ray examination after the injection of Ipydol is always profitable. Three cases of strawberry gall bladder were cured by cholecystectomy. In 1 of these there were intramural calculi such as have been described by Gosset and others. In spite of the recent revival of cholecystostomy the author prefers cholecystectomy.

When the liver is enlarged and there are other obvious signs of hepatitis, drainage of the ducts is indicated and removal of the gall bladder is advisable.

In the discussion of cholecystitis with predominant gastro-intestinal symptoms various accidents are mentioned. In 1 case seen by the author the duodenum was obstructed by a calculus. Obstruction usually has a very high mortality. Peritonitis is seldom an indication for gastro-enterostomy. When gastro-enterostomy is necessary it should be done at a second operation. Although the appendix is frequently diseased, its routine removal is not advisable.

Of the pre-operative measures to be taken, the author believes that a determination of the blood urea is the most important.

The preferred incision is a midline incision or the transverse incision of Spengler. Kehr's incision is responsible for a large number of eviscerations.

Direct exploration of the common duct should be done routinely as a stone in the common duct may cause no symptoms.

When even mild pancreatitis is present drainage of the ducts is indicated.

In removing the gall bladder the author employs the retrograde method routinely because the neck is generally free from adhesions. No effort is made to remove the cystic duct entirely. In fact, it is preferable to leave a stump about 1 cm. long.

Subserous cholecystectomy is not always technically feasible.

Drainage of the subhepatic area is established routinely. Recently the author has used rubber tubes to advantage.

The most common causes of death are cardiac and renal complications. The best results are obtained by cholecystectomy. After operation for chronic cholecystitis digestive disturbances are not uncommon, but as a rule they yield promptly to dietary treatment. ALBERT F. DE GROOT, M.D.

# GYNECOLOGY

## UTERUS

Spirack, M. The Histopathology of the Uterus in Relation to So-Called Essential or Idiopathic Uterine Bleeding *Surg., Gynec. & Obst.*, 1932, **lv**, 733

"Essential uterine bleeding" is defined as bleeding from the uterus in the absence of clinically detectable pathological changes in the genital tract except possibly enlargement of the uterus. It is called also "chronic metritis," "fibrosis uteri," "myopathia hæmorrhagica," "pseudometritis," and "uterine sclerosis." Its cause is not known.

The author made histological studies of the uterus in sixteen cases in which there was vaginal bleeding of varying severity and duration, and nine cases in which the uterus was removed because of some other condition.

Of the sixteen cases of bleeding uterus, pathological changes were found in the ovaries in 60 per cent and disease of the tubes with or without disease of the ovaries in 36 per cent.

Ten of the women with uterine bleeding were in the fourth decade of life, four were in the fifth, one was in the sixth, and one was in the seventh. Five were nulliparae, three were para-ii, one was a para-iii, one a para-vi, one a para-vii, one a para-ix, and one a para-xv. The parity of three was not determined. The shortest period of bleeding was four days and the longest two months. In the majority of the cases the bleeding had been continuous for three or four weeks.

On histological examination of the bleeding uteri hypertrophic and hyperplastic changes in the endometrium were found in ten (70 per cent) of the cases, cystic glands in five (35 per cent), and necroses of the stroma in five (35 per cent). Distinct signs of chronic inflammation of the mucosa were observed in only one case, in which radium had been introduced. Fibrosis was the rule. In twelve cases the fibrous tissue exceeded the myomatous tissue. In four cases the amounts of both were equal. The extreme amount was observed in aged and multiparous women. The elastica was increased in amount only in the parous uteri. The amount bore no relationship to the severity of the bleeding. In eleven cases the blood vessels were thickened. The thickening was most marked in aged and multiparous women. Endometriositis was found in eight (50 per cent) of the cases.

Of the patients without bleeding of the uterus, one was in the second decade of life, one was in the third, four were in the fifth, and two were in the sixth. The age of one is unknown. One was a nullipara, two were para-i, one was a para-iii, one a para-iv, and one a para-v. The parity of three is unknown. In

the cases of three (33 per cent), the endometrium was hypertrophic and hyperplastic. In 5 (55 per cent), cystic glands were found. Fibrous tissue exceeding muscle was present in four (44 per cent). Elastic tissue was increased to a varying degree in all parous uteri. Thickening of the blood vessels was seen in six (66 per cent) of the cases. Endometriositis was found in four (44 per cent). There was no necrosis or inflammation in the endometrium.

The author reports also experiments carried out on dogs, rabbits, and guinea pigs, with the female hormone in an attempt to determine whether the prolonged hyperæmia incidental to hyperfunction of the uterus will produce fibrosis, and whether prolonged action of the female sex hormone is capable of creating a histological picture similar to that of hyperplasia of the endometrium. It was found that "amniotin" in the dosage used was not sufficiently efficacious to produce the expected pathological picture, it caused only mild pre-castral changes.

The author concludes that there is no single feature or combination of features which is pathognomonic of idiopathic uterine bleeding.

M. C. FRIEDICH, M.D.

Courty, L. Acute Axial Torsion of the Fibromatous Uterus (La torsion axiale aigue de l'utérus fibromateux) *Presse méd.*, Par., 1932, **xl**, 790

Acute axial torsion of the fibromatous uterus must not be confused with the torsion of a subserous or interstitial fibroma. Torsion of pedunculated growths on the body of the uterus is frequently described. In the 2 cases of acute axial torsion of a fibromatous uterus reported by the author the uterus was twisted on the collum uteri. About 100 cases have been recorded in the literature. The condition occurs most frequently in older women with fibromata developing in the abdominal cavity outside of the pelvis. The elongation of the uterine isthmus is of great importance in its causation. The immediate cause may be sudden movements or contractions of the abdominal wall, but is often obscure.

The torsion generally occurs from left to right. It ranges from 90 to 360 degrees. Cases of complete section of the uterus have been reported. A sound cannot be passed into the uterine cavity. If operation is not performed immediately, hæmatometra results. The subperitoneal pelvic connective tissue becomes infiltrated with blood. The fibroma itself may undergo aseptic necrosis or infected gangrene. Blood is found in the broad ligaments and the abdominal cavity.

In the case of an older woman known to have a uterine fibroma the condition should be suggested by sudden excruciating pain accompanied by shock.

the wall shows plaques of necrosis. His reserves drainage for patients of advanced age or with low resistance. It may be performed under local anesthesia.

In a long discussion of chronic cholecystitis the author says that in the presence of a biliary fistula X-ray examination after the injection of lipiodol is always profitable. Three cases of strawberry gall bladder were cured by cholecystectomy. In 1 of these there were intramural calculi such as have been described by Gosset and others. In spite of the recent revival of cholecystostomy the author prefers cholecystectomy.

When the liver is enlarged and there are other obvious signs of hepatitis, drainage of the ducts is indicated and removal of the gall bladder is advisable.

In the discussion of cholecystitis with predominant gastro-intestinal symptoms, various accidents are mentioned. In 1 case seen by the author the duodenum was obstructed by a calculus. Obstruction usually has a very high mortality. Peritonitis is seldom an indication for gastro-enterostomy. When gastro-enterostomy is necessary it should be done at a second operation. Although the appendix is frequently diseased, its routine removal is not advisable.

Of the pre-operative measures to be taken, the author believes that a determination of the blood urea is the most important.

The preferred incision is a midline incision or the transverse incision of Spengler. Kehr's incision is responsible for a large number of eviscerations.

Direct exploration of the common duct should be done routinely as a stone in the common duct may cause no symptoms.

When even mild pancreatitis is present drainage of the ducts is indicated.

In removing the gall bladder the author employs the retrograde method routinely because the sac is generally free from adhesions. No effort is made to remove the cystic duct entirely. In fact, it is preferable to leave a stump about 1 cm. long.

Subcutaneous cholecystostomy is not always technically feasible.

Drainage of the subhepatic area is established routinely. Recently the author has used rubber tubes to advantage.

The most common causes of death are cardiac and renal complications. The best results are obtained by cholecystectomy. After operation for chronic cholecystitis digestive disturbances are not uncommon, but as a rule they yield promptly to dietary treatment. *Abstract F De Geuz, M.D.*

Oboeguanu, A. A Case of Incomplete Obliteration of the External Orifice of the Cervix by Scar Formation (Ein Fall von unvollständiger Narbenobliteration des Orificium externum des Uterushalses) *Re obst.*, 1931, x, 31

The case reported was that of a primipara twenty-one years old who entered the hospital for delivery at full term with premature rupture of the amniotic sac, a temperature of 38.4 degrees C, and tetanic uterine contractions. The fetal heart tones were not audible. Vaginal examination revealed effacement of the portio, occlusion of the external os by scar formation, and engagement of the presenting part which pushed the lower uterine segment downward. The occluded os was punctured with a small Hegar dilator and the cervix dilated completely by Bonnaire's method. The fetus, which was macerated, was removed by emhryotomy, and the placenta removed manually. Two cervical tears, 6 cm long, were repaired. On the fifth day after delivery the uterus was brought out of the abdomen by the Portes method because of puerperal sepsis. Death occurred three days later.

From the history given by the patient, the author concluded that the cervical occlusion was caused by cervicitis resulting from medication. BICKEL (G)

Davis, J E. A Study of 1,200 Cervices *Am J Surg.*, 1932, xvii, 32

The author states that this study was concerned chiefly with the significance of tissue trauma and repair in relation to the development of cancer. He stresses the importance of taking adequate tissue from a site in the cervix which looks and feels abnormal. For ideal histological study the specimen must be large enough to contain squamous epithelium, stroma, and endo cervical epithelium.

From his study Davis concludes that there is no evidence that mature normal tissues can pass over into a state of malignancy. He found signs of beginning malignancy most frequently in immature stratified epithelial cells which were exposed to chronic inflammatory effects.

He states that the prevention of cervical lesions is a most profitable field of therapeutic endeavor. In cases of laceration, erosion, ectropion, infection, and ulceration, adequate treatment yields a cure in almost every instance and prevents cancer formation in from 90 to 100 per cent of cases. He adds that it is rare to find reports of complete descensus of the uterus and coexisting cancer of the cervix. Cervices that are not lacerated or infected rarely, if ever, become malignant. GEORGE H GARDNER, M D

#### ADNEXAL AND PERIUTERINE CONDITIONS

Serdukoff, M G. Plastic Surgery of the Fallopian Tubes. Methods and Results (La chirurgie restauratrice des trompes. Ses méthodes et ses résultats) *Gynécologie*, 1932, xxxi, 193

Tubal sterility is more common than was heretofore supposed. Insufflation tests and metrosalpin-

gography have shown impermeability of the tubes in about 70 per cent of cases of sterility.

The rational treatment of resistant types of tubal sterility is plastic surgery such as salpingostomy, tubal implantation, salpingolysis, and combinations of different interventions.

Any surgical intervention for sterility should be preceded by insufflation and metrosalpingography to determine the site of the obstruction.

Before operation it is necessary to be certain that inflammation and infection are absent. This can be ascertained by a study of the sedimentation rate of the erythrocytes, examination of the vaginal and cervical flora, leucocyte counts, and the use of massage or vaccines to light up latent infection.

The best late results are obtained by salpingostomy. According to most reports, this procedure always results in cure. The immediate results of plastic surgery on the tubes are very good, pains and dysmenorrhoea cease, and the uterus is in a more normal position.

The incidence of favorable results after tubal implantation varies from 20 to 33 per cent. The technique of the operation is not difficult. The steps are (1) probing of the tubes, (2) implantation by introducing the end of the tube without dissecting it, behind the mesentery, and (3) incision for the implantation made at the level of the cornu in unilateral cases and at the level of the base of the uterus in bilateral cases. From fourteen to thirty-one days after the plastic operation the results should be determined by insufflation or metrosalpingography. This should have a favorable effect by destroying adhesions.

Every woman operated upon for impermeability of the tubes should receive a certificate stating the type of intervention and the findings of postoperative insufflation or should be presented with a metrosalpingogram.

After plastic surgery, normal pregnancy and delivery are possible, but the patient should preferably be delivered in a hospital.

Contra-indications are (1) active infectious or inflammatory processes, (2) too short an interval after the operation (less than three years), (3) marked atrophy of the uterus, (4) very advanced destructive changes in the ovaries, and (5) the usual diseases and affections that endanger life and health in pregnancy.

The author performed plastic surgery for impermeability of the tubes in twenty cases. In six, a salpingostomy was done, in ten, the tubes were implanted into the uterus, and in four, salpingostomy was combined with implantation.

EDITH S MOORE

Gliardino, E. Unusual Rupture of Ovarian Cysts (Rottura non comuni di cisti ovarici) *Pi-stal di ginec.*, 1932, xiv, 70

The author reports sixteen cases of rupture of ovarian cysts. He states that this condition is unusual because gynecological diagnosis usually leads

and masses which occurs first in the lower abdomen and later becomes generalized. The abdomen is soft, and a large hard tender mass is palpable. On vaginal examination the vaginal dome seems unusually high and the uterus is found to form a mass with the tumor palpated through the abdominal wall. In one of the author's cases extra-uterine pregnancy was simulated. This is the pseudohemorrhagic form. In some cases the uterine torsion produces intestinal obstruction. This may be either mechanical or paralytic. In others, the attacks are intermittent, lasting only a few hours, but have a tendency to recur. Identical symptoms may be produced by the torsion of an ovarian cyst or solid tumor and by acute salpingitis superimposed on an old fibroma.

In cases not operated upon the mortality is 63 per cent, whereas in those receiving surgical treatment it is 8 per cent.

As a rule subtotal hysterectomy is indicated, but should be delayed a few hours for the shock to subside. Very rarely when the general condition is poor and the degree of torsion is slight, it may be possible to secure a successful result simply by untwisting the fibromatous uterus.

GEORGE DE TARNAT, M.D.

Spinnelli, M.: The Treatment of Cancer of the Uterus at the Spinnelli Clinic (Il trattamento del cancro dell'utero nella clinica Spinnelli) *Atti della R. Acc. di M.* 1934, 2, 1

Spinnelli presents the results obtained in 530 cases of cancer of the uterus treated at his clinic in Naples during the period from November, 1914, to December 1931. These cases were divided as follows:

Location or stage of tumor	Total number of cases	Cases treated in period from 1914 to Dec. 1926	Cases treated in period from 1927 to Dec. 1931
Precancerous	83	46	
Cancer of body of uterus	73	37	37
Cancer of cervix			
Operable	54	27	27
Borderline	52	49	
Inoperable	22	26	31
Advanced	198	53	49
Total	390	212	153

Lesions were classified as precancerous after a careful study of the history especially with regard to the patient's present complaints and family history of a tendency toward cancer; a thorough clinical study of the lesions, and biopsy on tissue removed.

The 530 patients were treated in various ways: 16 by operation alone (complete hysterectomy), 9 by combined operation and irradiation, 449 by irradiation alone, and 66 by palliative measures.

The percentage incidence of cure as compared with that in other clinics was as follows:

Condition	Radical and X-ray therapy						Number of cases treated by operation
	Radical	Radical	Radical	Radical	Radical	Radical	
Precancerous	100						
Cancer of corpus	47.8						37
Cancer of cervix							
1. Operable	26	47.8	42	30	44		27
2. Borderline	51.4	27.9	26	34	27		
3. Inoperable	22	1	26				
4. Advanced	8	7		26.8			

In conclusion Spinnelli states that the best results from irradiation are obtained in large clinics where the treatment is given with good equipment and by experts.  
OSCAR H. G. GARDNER, M.D.

Kernoffner, H.: The Immediate and Late Results of Treatment of Carcinomas of the Cervix Uteri (Behandlungsergebnisse und Dauerheilungen beim Gebärmutterkrebs) *Arch. f. Gynäk.* 1934, cxviii, 2, 2.

This is a statistical report on 522 cases of cancer of the cervix uteri observed in Peabody's clinic in Vienna in the period between 1917 and 1932.

Ninety-seven of the cases were operable, 153 were borderline, 183 were inoperable, and 62 were advanced. Operation was performed in 65 per cent. Because of the unsatisfactory results from irradiation in the earlier years, the indications for operation were at first rather flexible.

Two hundred and thirty-six complete hysterectomies were performed by the vaginal route, with a primary mortality of 6.3 per cent. The chief cause of death was infection of the urinary tract. One hundred and fourteen (47.8 per cent) of the women were living and well five years later.

Of 191 women treated only with radium, only 1 (4.8 per cent) are living.

Five of the 6 women whose cancer was complicated by pregnancy were cured by operation.

The percentage incidence of cure at Peabody's clinic as compared with that of 5 outstanding European irradiation centers is shown in the following table:

Cases	Irradiation			Operation and irradiation
	Munich 1912-1923	Paris 1919-1923	Stockholm 1917-1923	10 cases clinic of Peabody 1917-1932
Operable	49.5	47.8	49	47.7
Borderline	1	26		26.7
Inoperable	22.7	26	26	0
Advanced				0
Average	8	29	26.8	29.9

OSCAR H. G. GARDNER, M.D.

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EDITH S. MOORE

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to operation in the earlier stages of ovarian cysts. He concludes that when a diagnosis of ruptured follicular cyst has been made operation is contra-indicated. In doubtful cases operation should be performed without removal of the cyst. Removal of the cyst should be done only in cases with toxic symptoms.

ERNEST T. LEBOW, M.D.

### EXTERNAL GENITALIA

Lenormant, C., and Contades, X.: Abscesses of the Rectovaginal Septum (Les abcès de la cloison recto-vaginale). *Gynec et Obst* 1932, 214, 2.

Localized abscess formation in the rectovaginal septum is not uncommon despite the paucity of case reports in the literature. The authors report five cases, including two which were first reported by Lenormant in 1932.

Collections of pus in the rectovaginal septum result from infections of the uterus and cervix descending to the fibrous tissues of the rectovaginal septum through the lymphatics. As the vaginal-rectal lymphatic network communicates with the descending lymphatics, a secondary infection by intestinal organisms also results.

The abscesses are usually well defined. The inflammation extends from a point 2 or 3 cm below the posterior vaginal vault to a point 4 or 5 cm above the anus. The cul-de-sac and the retrocervical space are not involved.

The symptoms are similar to those of pelvic abscess—pelvic pain, a vaginal discharge and the symptoms of cervical or uterine infections—but the condition is differentiated from pelvic abscess by the absence of induration in the pelvis and posterior cul-de-sac and limitation of the tenderness and fluctuation to the rectovaginal space.

The abscesses are evacuated preferably by vaginal incision after the development of fluctuation. The abscess cavities contain foul-smelling pus and gas formed by intestinal organisms.

The authors five patients recovered promptly after evacuation of the abscess cavity spontaneously through the rectum or by surgical drainage through the vagina.

HAROLD C. MACE, M.D.

### MISCELLANEOUS

Zondek, B.: The Hormones of the Anterior Lobe of the Pituitary Gland. V. The Excretion of the Follicle-Stimulation Hormone in the Menstrual Cycle. VI. The Influence of Ovarian Transplantation and of the Sex Hormones on the Excretion of the Follicle-Stimulation Hormone After Castration (Ueber die Hormone des Hypophysenhinterlappens. V Die Ausscheidung des Follikelstimulationshormons im menuellen Zyklus. VI. Der Einfluss der Ovarialtransplantation und der Geschlechtshormone auf die Ausscheidung des Follikelstimulationshormons nach Kastration). *Klin. Wochenschr* 1935, 12, 22.

Zondek reports on experiments to determine the amounts of the hormones of the anterior lobe of the

pituitary gland which are excreted under normal conditions. In an average pituitary gland weighing 0.70 gm, which was obtained from a woman he found from 100 to 150 mouse units of follicle-stimulation hormone and from 35 to 50 mouse units of testosterone hormone. In the smaller pituitary gland of man, weighing up to 0.46 gm, he found from 60 to 100 and from 10 to 25 mouse units of these hormones respectively in the three to four times larger pituitary gland of the cow from 100 to 275 and 75 mouse units and in the pituitary gland of the pig, which weighed only one-tenth as much, 15 mouse units of each of the two hormones. However, these findings are no indication of the total production. The total excretion of the follicle-stimulation hormone (Prolan A) in the healthy normally menstruating woman was found to be 745 rat units for one cycle. Thirty-two of these units were excreted in the post-menstruum, 175 in the intermenstruum, 415 in the premenstrual stage, and 155 during menstruation. The daily output averaged 23 rat units and was least (8 rat units) in the postmenstruum. In the following phases it was 25, 20.3 and 25 rat units. A high excretion in the premenstrual phase is a peculiarity of the human female.

Folliculin is secreted continuously during the entire cycle, whereas Hormone A of the anterior lobe of the pituitary gland (follicle-stimulation hormone) is excreted discontinuously. The corpus luteum content of folliculin is also a peculiarity of the human being. The findings regarding hormonal conditions in animals cannot be applied to human beings.

The follicle-stimulation hormone then appears in the urine when the ovary ceases to function, especially therefore after castration. It can be demonstrated from about the eighteenth day after the operation when previously its presence in the urine could not be shown even by the concentration method. The length of time required for the re-establishment of hormonal equilibrium has not been determined. Zondek illustrates this effect of castration by the history of a case in which, several years after removal of the left adrena because of renal pregnancy, complete removal of the other ovary was necessary because of an ovarian tumor. From the eighteenth day Hormone A of the anterior lobe of the pituitary gland was present, although it had not been demonstrable previously. Neither by the homologous implantation of ovary nor by oestrogen subcutaneous injection of a total of 150 mouse units of folliculin-menstruum nor by the intravenous injection of 5,000 mouse units at one time was it possible to bring about any decrease in the amount of hormone of the anterior lobe of the pituitary gland. The amount was never less than 150 mouse units and once it rose to 200 mouse units. Intramuscular injections of corpus luteum hormone (Intropin, Henning) were likewise without effect. While the symptoms of cessation of ovarian function were favorably influenced by the treatment, the hormone content of the urine was still 150 mouse units nine months after the operation.

The question as to whether the substance giving rise to the reaction in the urine of pregnant women is identical with the hormone of the anterior lobe of the pituitary gland appears to Zondek to be answered by the fact that he was able to elicit the three reactions in the infantile mouse by implanting posterior lobe of the human pituitary gland. It was found, however, that the posterior lobe was penetrated by cell strands from the anterior lobe which consisted exclusively of basophile cells. When used in a similar experiment the posterior lobe of the cow was inactive as in this animal a similar penetration of cells into this lobe does not occur. Therefore it appears that the basophile cells produce the hormone. This applies only to the sex hormone, the hormone that influences metabolism may have another origin.

Zondek thinks that the presence of prolan in malignant tumors may be a sign of increased growth energy. The increased production of follicle-maturation hormone he regards as a reaction of the organism to the stimulated growth processes. This hypothesis is supported by the fact that the prolan disappears when the vital powers fail. In men, Zondek has sometimes found the complete pregnancy reaction in malignant tumors of the testicle, but he has never found it in tumors of the prostate. The hormonal substances are demonstrable in the tumor itself, whereas they may be absent in the pituitary gland. If Pituitary Reactions 1 to 3 are found in a man the malignancy of the tumor is certain.

It is possible to hasten the Aschheim-Zondek reaction by preliminary treatment with ether or the addition of dextrose to the urine. By the combination of the two procedures the reaction can be shortened to twenty-four hours.

In conclusion Zondek states that he has succeeded in bringing about pregnancy in infantile rats after treatment with the anterior lobe of the pituitary gland. In one of the animals the gestation went on to the birth of normal young. In an infantile rabbit an ovum was discovered about to become implanted in the uterine mucosa. In extended experiments it was possible to bring previously sterile cows into oestrus and gestation by administering prolan. In horses also, such experiments appear to hold out good prospects of success. In any case these experiments show that "the hormone of the anterior lobe is to be regarded as the predominant general and non sex-specific sex hormone."

In the discussion of this report, WINTZ (Erlangen) stated that from his research on the arterial and venous blood of the umbilical cord he had come to the conclusion that the substance excreted in the urine represents decomposition products of the fetus and not an internal secretion of the mother.

PHILIPP (Berlin) confirmed Zondek's finding that pituitary gland of the pregnant woman contains no prolan. He stated that during pregnancy this is formed exclusively in the placenta. After delivery, it appears again in the pituitary gland.

FELS (Breslau) supplemented Zondek's observations on castrated women by similar observations on

men. He was unable to demonstrate any changes in the hormone relations in men who had been castrated for a long time (by war injuries) or in men who had been subjected to the Steinach operation from ten days to six weeks previously.

LUETJGE (Erlangen) called attention to the identity of hormonal and ferment activity.

FLEISCH (G)

Stein, R. O. The Treatment of Gonorrhoea in the Female (Die Therapie der weiblichen Gonorrhoe). *Wien klin Wchnschr*, 1932, 1, 80.

In small girls, gonorrhoeal urethritis often heals spontaneously. Only rarely is it necessary to instill a few drops of a 2 per cent protargol solution or a 1 per cent solution of choleval. The treatment of the vaginitis is very tedious. It consists in copious irrigations, morning and night, with a 1:4,000 solution of potassium permanganate or a 1:1,000 solution of silver nitrate.

In cases of inflammation of the urethra with stormy symptoms in adults, local therapy is contraindicated. The treatment should consist of rest in bed, the application of heat to the region of the bladder, an absolutely bland diet free from peppered and salty food, meat, and alcohol, and the administration of a diuretic tea and sodium salicylate. After subsidence of the acute symptoms the instillation, once daily, of a few drops of a 2 to 5 per cent solution of protargol or a 2 to 8 per cent solution of choleval may be begun. After disappearance of the symptoms of irritation, applicators dipped in a 2 to 5 per cent solution of protargol, a 2 to 8 per cent solution of choleval, a 1/2 to 2 per cent solution of silver nitrate, or a 5 to 15 per cent solution of copper sulphate may be employed.

Infection of the vestibular glands must be considered. Paraurethral ducts infected with the gonococcus should first be evacuated by massage with the finger and then destroyed with the electrolytic needle or by electrocoagulation. Chronic gonorrhoeal Bartholin's is treated with drugs which kill the gonococci. These are injected into the excretory ducts of the glands with a fine cannula.

Condylomata acuminata are formed not only in gonorrhoeal leucorrhoea, but also as a reaction to the irritation produced by the secretion which causes a loss of epithelial cells that favors secondary propagation of the virus in the points of the condylomata. The pedicled forms of condylomata acuminata are removed under local anaesthesia, the sites of their implantation then being treated with the galvanocautery or by electrocoagulation. The quickly growing, wide-based, cauliflower-like condylomata are generally sensitive to the roentgen rays and are therefore treated by irradiation. The dose is 7 Holzknecht units filtered by 3 mm of aluminum. As a rule one treatment is sufficient, but in some cases it is necessary to repeat the irradiation after from four to six weeks. In some cases the tumors may be caused to regress by Biberstein vaccine therapy (from twelve to fifteen intracutaneous in-

jections of a carbolized sodium-chloride extract of carefully cleaned condylocysta).

In gonorrhea of the cervix, irrigations are without effect and tampons are unsatisfactory. Therefore it is advisable to apply a 1 to 8 per cent solution of protargol or choleval, a 20 per cent aqueous solution of formalin, a three times diluted solution of tincture of iodine, a 5 per cent solution of trichloroacetic acid, or a concentrated or half diluted solution of hydrogen peroxide by means of Playfair sounds after previous cleansing of the mucosa with a 10 per cent solution of sodium bicarbonate. Erosions of the parts heal best when touched with a 5 per cent solution of trichloroacetic acid followed by the insufflation of kaolin.

In rectal gonorrhea, suppositories containing protargol or choleval are used.

The intra-uterine treatment of subacute and chronic gonorrhea of the corpus of the uterus by the injection of protargol or choleval solution by means of urethral catheters is described.

Finally the author discusses the treatment of inflammatory conditions of the adnexa. This includes the use of hot air light baths, packing, and diathermy.

Vaccine treatment is indicated only when the Alseffer-Oppenheim complement fixation reaction is positive. It is then carried out according to the recommendations of Bucura with gonococcal vaccine or a mixed vaccine.

In gonorrhea of the uterus, sterilizing improvement is obtained from the intravenous injection of argochrom or trypanavine. HAYS (U. S. A.) (C)

Fellner, O. O.: Coriolated Vaginal Epithelia. (Estrus, and Menstruation. *Schneiderberg, Bronx and Menstruation. Arch. J. G. med.* 932, 1931, 287)

In his introduction Fellner discusses the terminology of the female sex hormone. To designate the pure substance, he continues to use his term "female" in preference to "folliculin, estrin, and menformin."

He has found that histological studies of the cyclic changes occurring in the vaginal epithelium under the influence of the hormone are best made on guinea pigs because on account of the longer cycle in these animals (thirteen to sixteen and a half days, three and a half days of which represent the stage of epithelial cornification) the various phases are more prolonged than in the rat and mouse.

The phase of epithelial cornification is identical with the premenstrual period. Just before and during this phase there is forward in the animal and the human female a functional layer which overlies the squamous epithelium. An intra-epithelial layer of cornification develops beneath the proliferating glands and epithelial cells in the cervix and vagina. The superficial cellular layers are cast off while the cornified layer spreads upward from the lower portions of the vagina. In the post-ovulatory phase, destruction of the proliferating masses occurs. The absence of leucocytes during the phase of epi-

thelial cornification is due to closure of the cervix by the proliferating epithelium and the density of the cellular layers and the cellular substance in the proliferating masses.

In disagreement with Mahnert, Fellner believes that rupture of the follicle occurs at the end of the phase of epithelial cornification, and that the corpus luteum is formed during the post-ovulatory period. He states that the corpus luteum reaches its maximum development in the interval phase and degenerates during the post-ovulatory period.

With regard to the blood content of the uterus, the author concludes from his autopsy findings that the precornification stage is characterized by hyperemia, the cornification stage is characterized by hyperemia and infiltrating hemorrhage, and the end of the cornification stage and the postcornification stage are characterized by bleeding.

Contrary to Zondek and Aschheim, Fellner believes that the cornified epithelial epithelium is the functional instead of the cornified epithelium. He calls attention to the fact that both the cornified cells and the functional are characterized by weak affinity for stains, especially at the end of the cycle.

He states that the period of estrus is not identical with the cornification phase. In experiments on guinea pigs it was found that practically as many of the animals became impregnated during the cornification phase as in other phases.

That females produce an inclination toward copulation is evident from the fact that previously refractory female rabbits accept the male while held an hour after its administration. However if the period of heat is to be compared with the period shortly before the occurrence of bleeding in animals which show no cornification phase, then increased libido must always occur before the stage of bleeding phase. In the dog, libido does not occur before eight days after the cessation of hemorrhage. The rabbit, which has neither a cycle nor a true estrus, must be assumed to be in constant heat since conception almost always follows immediately after copulation and corpora lutea are almost never formed if the animal is not pregnant. Only after delivery is there a cornification phase. The corpora lutea evidently contains an estrus-inhibiting substance. The rabbit is able to conceive at any time because it almost never forms corpora lutea.

Fellner explains in detail the value of the cornification stage of the mouse in the standardization of extracts. The number of animals in which the ovary regenerates after castration is so great (85 per cent according to Davenport) that only from twelve to forty may be used if the vaginal smears are to be carefully controlled. There are also, according to leading authorities such as Parkes and Bellamy, enormous differences between animals due to differences in their capacity to react. Fellner finds that determinations based on the hypertrophy of the uterus of immature rabbits weighing about 1 kgm. is more certain. It is assumed that five animals from different litters manifest the average normal reac-

tion Fellner injects only once and examines the animals at the end of six days. Only an increase in the cross-section of the uterus is considered as a unit of measure (corresponding to about twenty mouse units). A microscopic examination is made to rule out hypertrophy from pathological conditions. Fellner includes in his article a detailed table which gives the feminin content of various substances as determined by various investigators. The number of mouse units per kilogram found by Fellner in various substances was as follows: testis, 5; hen's egg, 5; fish eggs, 1,200; rye germ, 200; maize, 150; oats, 200; and linseed, 50.

Fellner's investigations have shown that feminin produces the cornification phase, and that the chief source of feminin is the corpus luteum. In contrast to Zondek and others, Fellner found, by his test based upon hypertrophy of the uterus, that the corpus luteum of animals as well as the human corpus luteum contains large amounts of feminin, even more than the placenta. The conflicting opinions of various investigators based on tests of extracts he believes may be explained by slight variations in the products caused by decomposition of the hormone by oxidation. Against the theory that the follicle is the source rather than the point of storage of the hormone are (1) Zondek's demonstration that the granulosa cells contain no folliculin, (2) the fact that the hormone content in the human female reaches its maximum between the fifteenth day after menstruation and the next menstruation, a time when no mature follicles are present, and (3) the demonstration by Seitz and Wintz that in mice subjected to intra-uterine castration by the X-rays a regular cycle continues in spite of the absence of the follicles. In animals in which Fellner destroyed all follicles from two to three days before the time of the œstrus phase (phase of epithelial cornification) the œstrus phase appeared at the expected time, showing the presence of feminin in the absence of the follicles.

The onset of œstrus is determined by the formation of an inhibitory body in the corpus luteum in the stage of vascularization, and especially during its existence in pregnancy. When the formation of this inhibitory body stops, the production of feminin gains the upper hand, œstrus occurring when the feminin effect which has been inhibited can manifest itself. By the administration of adequate doses of feminin Fellner was able to overcome the inhibitory effect and bring about a constant state of œstrus in the absence of corpus luteum formation (hormonal sterilization?). During pregnancy when the placenta supplements the corpus luteum, he was able to demonstrate in animals that the cycle is not entirely absent, at regular intervals there appeared an incomplete œstrus phase showing about 20 per cent leucocytes. Even during pregnancy a complete œstrus stage can be produced by the administration of sufficiently large doses of feminin. As yet Fellner has not succeeded in isolating the inhibitory substance. He believes that it has not been proved

that this substance is formed in the corpus luteum. The mammary gland may have some effect. Continued implantation of the mammary glands of pregnant animals resulted in absence of œstrus for a period of three weeks. "It is not unlikely that the mammary gland produces a substance which inhibits œstrus, either by itself or in conjunction with the inhibitory substance of the corpus luteum."

The increase in the production of feminin in the ovary during pregnancy is not sufficient to explain the enormous increase in excretion of feminin during pregnancy. The excess is formed by the placenta. Feminin is indispensable for maintenance of the life of the fetus. In animals with multiple embryomata the elimination of feminin by castration in the beginning of pregnancy leads to death of the products of conception. In the human female, however, death of the fetus does not occur if the amount of hormone produced in the ovary is sufficient.

In agreement with Zondek, Fellner believes that feminin has its origin in the theca cells, since with the increased production of feminin at the beginning of pregnancy no luteinization of the theca or interstitial cells can be demonstrated histologically. The difference in the findings reported with regard to the onset or failure of onset of œstrus following the implantation of substance or the use of extracts of the anterior lobe of the pituitary gland may be due to differences in dosage or the preparation or state of preservation of the substance of extracts. Only the lutein cells produced in transplantations are true lutein cells which can bring about termination of the cycle and proliferation of the uterine mucosa and musculature. The alkaline extracts of Long and Evans produce the œstrus phase, but the uterus remains small. Zondek's Prolan A causes ripening of the follicles but no luteinization. Prolan B, on the other hand, produces the hormone of the corpora lutea and pregravid proliferation of the endometrium. The alkaline extract produces the inhibitory substance, and Prolan B causes the production of feminin. Accordingly, there are four hormones in the anterior lobe of the pituitary gland, the growth hormone, the ovulation hormone, a luteinizing hormone for the inhibitory substance, and a hormone for the lutein cells producing feminin. According to Fellner's investigations there may be still possible another—a substance which favors the formation of hæmatomata which is rare in the human female but more common in the pig, especially the very fat pig which produces less feminin. This is manifested when small doses of prolactin produce many hæmatomata and large doses produce only a few. Luteinization of the ovary under the influence of Prolan B leads to the production of feminin which inhibits the formation of prolactin. This results in disintegration of the corpus luteum, a decrease in the amount of feminin, increased secretion of the anterior lobe of the pituitary gland, ovulation, and the formation of new corpora lutea.

The course of this cycle depends upon the structure and state of the uterus in addition to the in-

fluence of hormones. Implantation studies have demonstrated that the mucous membrane of the non-pregnant uterus contains the luteinizing hormone, although in only small amounts as compared with the decidua. During pregnancy this hormone is produced in large amounts in the decidua, and partially also, according to Fellner's studies, in the chorionic villi. That this is an secretion which inhibits the cycle is evident from the fact that in young guinea pigs whose uteri were removed shortly after birth the first oestrous phase appeared from four to six weeks following corpus luteum involution, whereas normally it occurs at about the third month. In this observation the author seeks an explanation of the variations in menstruation following spontaneous abortion and abortion by curettage, believing that retained endometrial fragments, through their secretions, increase the secretion of the anterior lobe of the pituitary gland.

Feminin is to be regarded as the cause of menstrual bleeding. If experimental animals are maintained under a constant and equal hormone influence by means of injections of feminin at intervals of thirty minutes (with the use of a preparation which has been purified successively with alcohol, ether acetone, and again with 70 per cent alcohol) the uterus does not become hyperemic even after the injection of 1,000 mouse units, but if after these injections, there is added injections of an ether extract

which has been shaken out with acidified water it becomes strongly hyperemic in one-third of the animals and moderately hyperemic in another third. The acidified water therefore contains a substance counteracting the feminin dissolved in the ether. Feminin increases the contractility of the rabbit uterus isolated in Ringer's solution. Repeated doses of feminin have a hemostatic effect.

The menstrual process cannot be explained satisfactorily if we proceed from the concept that the corpus luteum inhibits its onset. If luteolysis is carried out during the first half of the intermenstruum, menstruation fails to occur because the corpus luteum which is thereby destroyed has not as yet produced enough feminin to cause bleeding. During the second half of the intermenstruum a sufficient amount of feminin produced in the corpus luteum is present in the circulating blood and the follicular substance produced by the corpus luteum is absent. A comparative study in various animals showed that the maturing follicle has no effect. It is evident also that the granulosa cells are ineffective, as menstruation does not take place at the time when they reach their maximum development.

After reviewing the theories of Frank, Majalet, and Corbet Fellner presents his own theory which is based on the facts cited and concludes his article with a review of the properties of feminin as reported by himself and others. FINCH (11).

# OBSTETRICS

## PREGNANCY AND ITS COMPLICATIONS

Essen-Möller, E. Some Reflections on the Treatment of Placenta Prævia. *J Obst & Gynec Brit Emp*, 1932, XXX, 227

Essen-Möller discusses the various methods of treating placenta prævia and reviews briefly his own experience in 240 cases

In the older methods the attempt was made to stop the hæmorrhage by pressing the detached portion of placenta against the exposed placental site. This was done by (1) plugging the vagina (the oldest method), (2) rupturing the membranes, (3) bipolar version, and (4) the use of the metreurynter. By none of these procedures was it possible to stop the hæmorrhage until the cervix had attained a certain degree of dilatation

In the newer method, cesarean section, the uterus is emptied before the cervix becomes dilated and consequently before the placenta has had time to become detached to any noteworthy extent

The author says that each case must be considered individually. In 95 of his cases puncture of the membranes was followed by spontaneous delivery with only 1 death. HARRY M. NELSON, M.D.

Berkwitz, N. J., and Lufkin, N. H. Toxic Neuro-nitis of Pregnancy. A Clinicopathological Report. *Surg, Gynec & Obst*, 1932, LV, 743

That infections, trauma, and pressure upon nerves during pregnancy may produce paralysis is well known, but it is not generally recognized that paralysis may result from auto-intoxication during pregnancy

The nerve involvement dealt with in this article occurs as a rule in the early part of pregnancy and usually follows uncontrollable vomiting. Infections and local injuries to the sacral plexus are difficult to rule out. Paralysis occurring after delivery is not included in this report

The authors have collected fifty-two cases presenting neurological changes which they believe were dependent upon pregnancy. They themselves have observed four cases. Three of their patients died and one recovered. They report their cases in detail and summarize and tabulate the fifty-two cases they have collected

Many divergent theories have been offered to explain the neuronitis of pregnancy. The causes most frequently suggested are anæmia, uræmia, rheumatism, hysteria, and malnutrition. As 50 per cent of women suffer from nausea and vomiting in the early part of pregnancy, Bouchard concluded that all pregnant women suffer to a great or less extent from auto-intoxication. However, the cases of neuronitis of pregnancy studied by the authors

presented a picture which was distinct both clinically and pathologically from that of complications due to toxic conditions of pregnancy

In the neuronitis of pregnancy the clinical and pathological pictures of the nerve changes are the same as those resulting from alcoholism, infectious diseases and disturbances due to diet deficiency such as beri-beri and pellagra. The blood chemistry is normal. Cloudy swelling found at autopsy is an index of the retention of toxic products

The condition occurs most frequently between the twenty-first and thirty-first years of age. It is most common also during the first and second pregnancies. The vomiting begins in the first two months and gradually assumes the pernicious form. It rarely responds to the usual treatments, but ceases abruptly when the first symptoms of paralysis appear. The patient is generally dehydrated and emaciated. The blood pressure and the temperature are not changed. The pulse rate is 120 or more

The paralysis begins in the third or fourth month. Starting in the lower extremities, it later involves the abdominal muscles, diaphragm, thorax, and upper extremities, and in some cases the cranial nerves. Optic neuritis occurred in the authors' four cases. Toxic psychoses develop, and the patient may be delirious, confused, and disoriented

The urine is free from albumin and has a normal specific gravity. The blood picture is also normal. The spinal fluid is usually negative, but occasionally shows a slight increase in lymphocytes

The characteristic lesions are degenerative changes of the peripheral nerves and anterior horn cells and petechial hæmorrhages in the brain and cord

The most satisfactory treatment seems to be interruption of the pregnancy as soon as definite neurological symptoms appear. The mortality of the condition has been about 25 per cent, but would probably be greatly reduced by early treatment

Toxic neuronitis of pregnancy is rather rare, but its serious character demands a thorough neurological examination of pregnant women with hyperemesis. M. C. EHRLICH, M.D.

Wilson, K. M., and Garvey, P. Polyneuritis Gravidarum a "Presumable" Toxæmia of Pregnancy. *Am J Obst & Gynec*, 1932, XXIII, 775

The authors report the cases of three women who presented signs of extensive polyneuritis during pregnancy. The condition was accompanied by a profound mental disturbance and at the onset by severe and persistent vomiting. While this acute form is an unusual complication of pregnancy, it is extremely serious, having a high mortality

In two of the authors' cases there was a profound disturbance of the general metabolism characterized

fluence of hormones. Implantation studies have demonstrated that the mucous membrane of the non-pregnant uterus contains the luteinizing hormone, although in only small amounts as compared with the decidua. During pregnancy this hormone is produced in large amounts in the decidua, and partially also, according to Fellner's studies, in the chorionic villi. That this is an inhibition which inhibits the cycle is evident from the fact that in young guinea pigs whose uteri were removed shortly after birth the first estrus phase appeared from four to six weeks following corpus luteum involution, whereas normally it occurs at about the third month. In this observation the author seeks an explanation of the variations in menstruation following spontaneous abortion and abortion by curettage, believing that retained endometrial fragments, through their secretions, increase the secretion of the anterior lobe of the pituitary gland.

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The menstrual process cannot be explained satisfactorily if we proceed from the concept that the corpus luteum inhibits its onset. If irradiation is carried out during the first half of the intermenstruum menstruation fails to occur because the corpus luteum which is thereby destroyed has not yet produced enough feminin to cause bleeding. During the second half of the intermenstruum a sufficient amount of feminin produced in the corpus luteum is present in the circulating blood and the inhibitory substance produced by the corpus luteum is absent. A comparative study in various animals showed that the maturing follicle has no effect. It is evident also that the granulosa cells are ineffective, as menstruation does not take place at the time when they reach their maximum development.

After reviewing the theories of Frank, Mahner, and Corner Fellner presents his own theory which is based on the facts cited and concludes his article with a review of the properties of feminin as reported by himself and others. FRANK (3).

Therefore, during the period after delivery as well as during pregnancy, disturbances of renal function seem to be found chiefly in cases with cerebral symptoms.

These investigations of renal function have demonstrated a qualitative difference between the kidney of pregnancy and the kidney of eclampsia, but none of the findings disproves the conception of the kidney of pregnancy as a nephrosis.

It is shown that pathologico-anatomically as well as clinically and functionally there is a close resemblance between the renal condition in eclampsia and the renal condition caused by temporary interruption of the circulation of blood through the kidney. The author therefore considers it probable that the renal condition in eclampsia is caused by spastic contraction of the arteries.

As the cerebral symptoms occurring in cases of eclampsia and eclamptic uræmia are identical, he believes it logical to suppose that they have the same immediate pathogenesis. However, as eclampsia may develop without albuminuria and as hypertension and the tendency toward the development of œdema are of extrarenal origin, the clinical picture of eclampsia cannot rightly be designated as eclamptic uræmia.

Finally the author points out the possibility that under certain conditions the change in the quantitative relation of the blood colloids and therefore the tendency toward the development of œdema might be explained solely by the withdrawal by the fetus of materials for the formation of its proteins.

Brusgaard, C. Diabetes and Pregnancy (Diabetes und Schwangerschaft) *Norsk Mag f Lægevidensk*, 1932, xcvm, 33.

Among approximately 40,000 women delivered in the Gynecological Clinic of the University of Oslo in the last twenty-five years there were 12 women with diabetes mellitus who altogether had 17 pregnancies.

The diagnosis of diabetes mellitus complicating pregnancy may be quite difficult as two physiological anomalies of pregnancy—the glycosuria and the acidosis of pregnancy—have a resemblance to the disturbance of metabolism due to diabetes. The glycosuria of pregnancy differs from the lactosuria of advanced pregnancy and the puerperium in that the lactose is not fermented by ordinary beer yeast. The glycosuria of pregnancy is an extra-insular irritation glycosuria. In this condition the blood-sugar content is usually normal and the excretion of sugar is small and practically independent of the carbohydrate intake. All diabetic complaints are absent. The condition is harmless and disappears at the termination of pregnancy. The blood-sugar curve after the oral or intravenous administration of sugar is normal. The glycosuria is refractory to the administration of insulin.

The acidosis of pregnancy is increased by a diet poor in carbohydrates. A disturbance of liver function may easily be assumed.

It has long been recognized that diabetic women seldom become pregnant. The incidence of pregnancy in such women is only about 5 per cent. In 1917 Von Noorden reported that, of 240 married diabetic women, only 9 had become pregnant but in 1927, the number was increased to 43. The increase was due to the use of insulin therapy. Similar observations were made in the clinic at Oslo as 11 of the 12 women whose cases are reviewed by the author responded to this treatment. Five of these women were under thirty years of age. After treatment of the diabetes, 2 of them became pregnant 3 times and 1 became pregnant twice. In the case of 1 woman, the second pregnancy was interrupted in the second month. The 1 woman who was treated before the introduction of insulin died at the end of her pregnancy.

Of the 17 infants of these 12 women, 8 (47 per cent) died before birth, most of them near the end of the pregnancy. It was worthy of note that 6 of the infants weighed more than 8 lb and 2 of them weighed over 10 lb.

In several cases there was a history of abortions. Some of the abortions were due to the conditions which lowered the ability to conceive, namely, low vitality of the ovum, disturbances of nutrition in the placenta and the hydramnios which is frequently observed in diabetics.

The course of labor in diabetics does not differ from the course of labor in normal women. In the puerperium fever is absent, involution takes place normally, and no predisposition toward thrombosis and embolism is apparent.

The treatment of diabetes in pregnancy does not differ essentially from the usual modern treatment of diabetes. The chief difference is that the control tests must be carried out every eight to fourteen days to determine whether any changes in the diet and the dosage of insulin are necessary. The tendency toward acidosis must be reckoned with and care must be taken not to reduce the carbohydrate intake too much. The women should be treated with insulin even though, in the absence of pregnancy, they do not need it. According to the material of the Gynecological Clinic of the University of Oslo, difficulties are experienced chiefly on the first day after delivery for, as the result of improvement in tolerance, there may be a hypoglycæmic shock necessitating a considerable reduction in the amount of insulin administered.

The author comes to the conclusion that the prognosis of pregnancy in diabetic women is doubtful but apt to be favorable. The prognosis with regard to the child is uncertain and usually unfavorable. Women with mild diabetes mellitus usually go through pregnancy without difficulty. In serious cases of diabetes interruption of the pregnancy is to be recommended and sterilization may be advisable. According to the experience of the Gynecological Clinic of the University of Oslo, sterilization may be carried out by laparotomy under local anesthesia four or five days after delivery. SAENGER (G)



particularly by a high carbon-dioxide combining power and a low chloride content of the blood. The findings were those of an alkaloia, but as the hydrogen-ion concentration was within the normal limits, the condition must be regarded as a compensated alkaloia. In the third case no profound change in the metabolism was noted but as the carbon dioxide combining power was 58.1 per cent and the content of chlorides in the blood was 464 mgm., there was at least a tendency in the same direction.

The exact cause of the condition being unknown, treatment can obviously be given only along general lines. In the presence of persistent vomiting the administration of fluids, saline and glucose solution, by various methods appears logical, as in the treatment of persistent vomiting. As the presence of an alkaloia is possible the administration of alkalies is contra-indicated.

The treatment of the affected peripheral nerves should be along the lines of the usual treatment for similar lesions arising from other causes. In the event of permanent disability orthopedic appliances may become necessary. E. L. COHEN, M.D.

Olsen, A.: Investigations on Renal Functions in Eclampsia and Related Complications of Pregnancy (*Eklampsie Untersuchungen über die Nierenfunktion bei Eklampsie und bei damit ver wandten Schwangerschaftserkrankungen*). *Acta obst. et gynec. Scand.* 95. 12, Supp. 4.

The author reviews the theories of different periods regarding the nature of the kidney of pregnancy and its importance in the pathogenesis of eclampsia.

As both hypertension and a tendency toward edema may occur in pregnancy in the absence of kidney disease, it is necessary in classifying the kidney of pregnancy to consider chiefly the function of the kidney. However renal function in cases of eclampsia and related conditions must be compared with renal function in normal pregnant women and not with the renal function of normal persons who are not pregnant.

From 333 determinations of the blood urea and the non protein nitrogen of the blood of normal pregnant and parturient women the following conclusions are drawn:

1. In normal pregnant women the blood urea is lower than in normal non-pregnant persons and the difference is so considerable that it must be biologically conditioned.

2. The non-protein nitrogen of the blood is reduced in normal pregnancy but only by the quantity of nitrogen which corresponds to the reduction in the blood urea.

3. In the blood urea there is no distinct difference between the successive fortnightly periods during the last ten weeks of pregnancy or in parturition.

In the cases of 44 pregnant and parturient women with hypertension, 34 with albuminuria, 34 with hypertension and albuminuria, 43 with hyperten-

sion, albuminuria, and edema, 34 with pre-eclampsia, 27 with eclampsia, and 13 with various other complications of pregnancy: 1100 determinations of the blood urea and 300 determinations of the non-protein nitrogen of the blood were made. From these the following conclusions are drawn:

1. In all groups there is an increase in the blood urea as compared with the normal, and except in the first group, the difference is so great that it must be biologically conditioned.

2. This difference increases from group to group, but even in cases of eclampsia values above the limit of the blood urea in normal pregnant women are rare and sometimes low values are found.

3. In cases of pre-eclampsia and eclampsia a considerable increase in the blood urea (up to 151 mgm. per 100 c.c.m.) is generally found during the first few days after delivery whereas in the other groups an increase is rare.

4. Fever, nausea, hemorrhage, and pyrexia are not responsible for the increase.

To distinguish between uremia caused by overproduction and uremia caused by retention, direct determinations of renal function are necessary.

At the time of the occurrence of eclampsia the only direct tests of renal function which may be employed are those which can be undertaken without causing the patient any strain, such as Ambard's or von Slyke's urea test and, in certain cases (those with a measurable creatinin retention) the Holten and Rehberg creatinin test. Comparative examinations having shown that there is an almost perfect correlation between the results of the Ambard test and the Holten and Rehberg test, the author employs the former routinely.

Olsen summarizes the results of his functional tests as follows:

Among "normal" pregnant women 3 types may be distinguished—one with function which is slightly increased and the other with function which is slightly reduced as compared with the renal function of normal non-pregnant persons. Therefore during pregnancy the limits of the normal are somewhat wider than in the non-pregnant state.

2. During pregnancy even in cases of considerable hypertension, serious albuminuria, and general edema, no definite reduction of renal function has been observed in the absence of cerebral symptoms.

3. In 85 per cent of cases of pre-eclampsia and eclampsia there is a reduction of renal function during the first days following delivery. At first, and during Stroganoff treatment, this is often so marked as to suggest cessation of function.

However in 2 of 6 cases of eclampsia no reduction of renal function whatever could be demonstrated. These 2 cases are discussed in detail.

Of the cases with hypertension, albuminuria, and edema—reduction of function was noted in 41 per cent but as a rule it was less marked than in cases of eclampsia and pre-eclampsia.

In the remaining groups no case of definite reduction of renal function was observed.

case. In both instances there was a marked hemorrhagic infiltration of the uterine wall in the region of the retroplacental hæmatoma—not in the depth of the musculature, but in its upper layers just beneath the serous coat.

After discussing the various factors to which premature separation of the placenta has been ascribed (renal diseases, cardiac defects, exophthalmic goiter, infectious diseases, constitutional conditions), the author comes to the conclusion that premature separation of the placenta and hæmatoma formation in the wall of the uterus have a common toxic cause, the hæmatoma being the milder result and the placental separation the more severe result of a toxic vascular injury. In spite of the separation and of the changes in the uterine wall, the contractility of the site of insertion of the placenta is not diminished.

With regard to the diagnosis, Naujoks calls attention to the fact that, in addition to the generally known symptoms, a large amount of blood appears in the amniotic fluid. This intra-amniotic hæmorrhage is explained by rupture of the retroplacental hæmatoma into the amniotic sac. Analogously, intra-amniotic effusions of blood are found on the fetal side of the placenta, corresponding to the umbilication on the maternal side.

In severe cases immediate laparotomy (cæsarean section) is recommended. However, in spite of the intramural apoplexy, the uterus should be preserved unless its sacrifice cannot be avoided.

The second cause of hæmorrhage during labor to be discussed is placenta prævia cervicalis in creta. The author reports a number of very interesting cases in which a thorough histological study was made at the Marburg Clinic. The danger of hæmorrhage in this anomaly of placental insertion is due to the deep involvement of the musculature of the cervical wall. The hæmorrhage is not caused by the presentation of a placental lobe as the latter is not to be found in these cases. The diagnosis is usually not made until labor is in progress or until after the expulsion of the child. Hæmorrhages occurring early in pregnancy and continuing for a long time are in a certain sense pathognomonic. Tamponade of the already excessively dilated cervical canal may increase the bleeding by further distending the wall of the cervix. If the first tamponade does not control the bleeding immediately, no time should be wasted in changing the packing as the danger to life demands removal of the uterus.

The third cause of hæmorrhage associated with labor which is discussed by the author is total inversion of the uterus after delivery. A case of this condition is reported. The inversion is the result, not of mechanical processes (pressure on the fundus uteri, traction on the umbilical cord) alone, but of such processes combined with a constitutional predisposition (infantilism, asthenia). The mechanical cause is to be regarded as the exciting factor. There is a wide difference of opinion as to the dangers of inversion (vascular collapse, uncontrollable hæmor-

rhage, infection), and also as to the proper time for intervention for re-inversion. From his own experience the author concludes that the danger of shock and uncontrollable hæmorrhage is not very great. Nevertheless he advises immediate reposition carried out under light narcosis with the pelvis raised—as was done successfully in the case reported—in order to avoid these complications and utilize the relaxation of the puerperal uterus for bloodless re-inversion.

In the last part of the article the author discusses varicosis and the related formation of hæmatomata. He believes that in these conditions predisposing constitutional factors (relaxation of the fibers, hypoplasia) play a rôle. The clinical importance of varicosis in relation to the occurrence of hæmorrhages during or following labor is much greater than is generally believed. Varices may extend over the entire birth canal, from the vulva to the body of the uterus, and by their bleedings may suggest atony of the uterus, particularly in the puerperium. Vaginal hæmorrhages from ruptured varices occurring during labor are especially to be feared. As such hæmorrhages threaten life, cæsarean section should be done if tamponade is ineffective. A very interesting sequela of varices in the genital region is the formation of a hæmatoma in the vulva, vagina, or broad ligament. Congestion in a varicose plexus of the vagina or vulva during labor may give rise to the formation of a pseudohæmatoma, which disappears when the pressure is relieved. More serious are the true hæmatomata formed by discharges of blood from the rupture of nodular varices situated deep in the tissues. In addition to causing a great loss of blood, such hæmatomata may spread from the vagina extraperitoneally over the parametrium as far as the kidneys. The author reports a case in which this occurred. In some cases it is necessary to open such hæmatomata in order to control the bleeding by tamponade. In general, however, the treatment in these cases, as in cases of smaller hæmatomata, should be conservative. Occasionally a late incision, at the end of several weeks, will be required as spontaneous resorption is usually very slow.

F SIEGERT (G)

Bacialli, L. Hemiplegia Occurring in Labor  
(Emplegia in travaglio di parto) *Riv. ital. di ginec.*,  
1932, XI, 59

Hemiplegia developing during labor is rare. The author reports the case of a multipara twenty-seven years old who came to the clinic in labor with hemiplegia on the right side which came on shortly after the labor began. The urine was negative and the blood pressure 125-85. There was no cardiac lesion and no serological evidence of syphilis. The patient was delivered of a normal baby. She had a low fever for a week after delivery, but the lochia and the involution of the uterus were normal and she was discharged on the eighteenth day. Eight months later when she was again pregnant, she reported that she had had several more attacks

Sellheim, H.: The Interruption of Pregnancy by Means of Paste Injections. The Dangers of the Method and Attempts to Obviate Them (Schwangerschaftsunterbrechung mittels Salbeninjektionen, ihre Gefahren und Versuche die dieser Gefahren zu entgehen). *Monatsschrift f. Geburtsh. u. Gynäk.* 1913, 26, 441.

Sellheim emphasizes the importance of the intra-uterine injection of a paste or ointment for the interruption of pregnancy because it is both painless and technically simple. However several deaths following such injections have been reported recently.

Theoretically death may be caused by air embolism, fat embolism, and perforation of the uterus. Air embolism and uterine perforation may be prevented by a careful technique, and fat embolism by the use of an injection medium low in fat. The chief cause of death remains unknown. Sellheim suspects a toxic factor because experiments on animals show that even minimal amounts of the paste dissolved in saline solution are fatal when they are injected intra-venously. Histological examination of a uterus extirpated eighteen hours after an injection of paste showed that considerable amounts of the paste had reached the maternal blood stream. Accordingly a direct intoxication is possible. Therefore use should be made only of pastes of the lowest possible toxicity the consistency of which is not altered by the body temperature. Such media can be effective only mechanically by stimulating uterine contractions.

H. R. SCHMIDT (O)

## LABOR AND ITS COMPLICATIONS

Lemkowski, J.: Rupture of the Uterus During Labor (Über die Uterusruptur während der Geburt). *Gesundheitshefte*, 93 p. 700.

The author discusses sixteen cases of rupture of the uterus occurring during labor which were treated in the Obstetrical Clinic of the University of Lemberg. The rupture occurred previous to the woman's admission to the clinic in thirteen cases and after her admission in three. All of the women were multiparae. Of ten women whose pelvis were carefully measured, the dimensions were normal in only two. In one of these cases definite degenerative changes of the muscle due to seven previous labors were found. In one case there was a frontal presentation and in one case a hydrocephalus. Among eleven cases with a definite record of the presentation there were three with transverse position of the fetus. The large percentage of neglected transverse positions is attributed by the author to insufficient education of the midwives, especially in the rural districts where the physician is always called too late. As a result of a neglected transverse position of the fetus, ten (63 per cent) of the women died. The immediate cause of death was serious loss of blood, peritonitis, or pneumonia. In the majority of the cases the chief cause of the rupture of the uterus during the labor was obstruction to the labor.

Signs of threatening rupture of the uterus was absent in the cases in which the rupture occurred in the clinic and in three of those in which the rupture occurred before the patient entered the clinic. Shock from rupture was absent in one of the cases in which the rupture occurred in the clinic and in one of those in which it occurred before the patient's admission. Hemorrhage was absent in four cases. In ten of the sixteen cases the fetal parts could be palpated through the abdominal wall. In only one case was there any cyanosis or dyspnea.

The treatment of rupture of the uterus in the rural districts and in the clinic is described in detail. In the author's opinion delivery by the natural route is unfavorable as it may cause recurrence of the bleeding and infection. The woman in labor may be delivered and the Momborg belt then applied only when it is necessary to transport the patient a considerable distance and the bleeding is very severe. If transportation to the hospital will take longer than two hours, tamponade of the site of the rupture is indicated. After the child and the placenta have been removed by laparotomy in the hospital or in the clinic, total abdominal extirpation of the ruptured uterus should be done immediately. Only when the fetal head is firmly in the pelvis can delivery be carried out by the vaginal route. In cases of neglected transverse position previous to the laparotomy the prolapser arm should be supported as high as possible. The conservative procedure, namely suture of the rupture is justified only under exceptional circumstances, that is, when the rupture of the uterus has been present for only a short time and the edges of the rupture are smooth. In cases of incomplete rupture the child may be extracted through the natural passages and a firm sterile packing then applied. However this procedure is always associated with the danger of death from general infection such as occurred in one of the author's cases.

S. L. VON SOMMERHAUS (K).

Naujoks, H.: Unusual Causes of Severe Hemorrhages During Labor—Premature Separation of the Placenta, Cervical Placenta, Inversion of the Uterus, Varicosis, and Hematomata. (Seltenere Ursachen schwerer Geburtsblutungen—vorzeitige Placentalseparation, Placenta cervicalis, Inversion uteri, Varicosis und Hämatomabildung). *Arch. f. Gynäk.* 93a ed./Bd., 397.

This article is a valuable contribution to the diagnosis and clinical estimation of hemorrhages occurring in labor. The author bases his discussion on interesting personal cases.

The first part of the article deals with premature total separation of the normally inserted placenta. A case from the Marburg clinic is reported. Pictures and a description of the histological findings in the uterine wall in the region of the separated placenta. Histological examination revealed important changes in the uterine musculature which had an etiological relationship to the separation of the placenta. Similar changes were found in neither

# GENITO-URINARY SURGERY

## ADRENAL, KIDNEY, AND URETER

Kornblum, K. Some Observations on the Use of Intravenous Urography *Am J Roentgenol*, 1932, XXVIII, 1

Kornblum believes that many of the failures of intravenous urography are due to faulty roentgenographic technique

One of the most common causes of failure is the presence of bowel contents, especially gas. In the technique used by Kornblum, a single flat roentgenogram of the abdomen is made and if this shows the presence of too much gas a thorough enema is given and the patient is then re-examined. If gas is still present, a purgative is given and the urographic examination is put off until the next day.

To obtain more complete filling of the renal pelvis and ureters the author has found the use of a compression bag of great advantage. To eliminate the possibility of error in the reading of the roentgenograms from overdistention of the renal pelvis by the bag, he makes one roentgenogram before using the compression bag.

The time interval between the exposure of the plates of the series is of importance. As a rule the roentgenograms made early are the best. Intervals of fifteen minutes, forty-five minutes, and one hour and fifteen minutes after the injection are usually advocated. Multiple exposures on a large film are best. To be of significance, morphological and functional abnormalities must be constant and present on every film. An ordinary roentgenogram should always be made before the injection is begun.

To eliminate blurring from movement such as that transmitted from the lung or the heart, high-speed equipment is necessary.

Kornblum makes stereoscopic roentgenograms only when they are indicated, as for the accurate localization of shadows found on the flat roentgenogram.

Throughout the examination the patient is kept in the recumbent position because in the vertical position the pelvis is poorly visualized on account of its rapid emptying. Kornblum has not found it necessary to have the patient void before the exposures are made.

The reading of the roentgenograms requires not only a knowledge of the morphological changes associated with pathological processes, but also the ability to interpret functional activity and evaluate its effect on the morphological changes present.

Complete and constant visualization of the ureter is indicative of obstruction even if the ureter is not dilated. As a result of obstruction, dye accumulates in the renal pelvis, causing increased density of the shadow.

Persistent absence of dye in the renal pelvis and ureter may indicate congenital or acquired absence of the kidney, permanent loss of kidney function, or temporary inhibition of kidney function.

Hyperfunction alone causes an increase in the pelvic shadow, as is to be seen in compensatory hypertrophy of one kidney when the other is diseased.

ANDREW McNALLY, M.D.

Mathé, C. P. Aneurism of the Renal Artery *J Urol*, 1932, XXVII, 607

The author reports the discovery of an aneurism of the renal artery in the course of operation on a dilated renal calyx containing calculi.

This is a rare condition, only fifty-five cases having been reported to date. The author tabulates these fifty-five cases. In 40 per cent the condition was due to trauma, and in about 25 per cent was considered to be a late sequela of contusion of the kidney.

In the author's case persistent pains in the loin on the left side and the findings of a complete urological examination led to the decision to remove the upper pole of the kidney containing the dilated calyx and stones. In 1925, the patient had slipped in the bathtub, striking the left lumbar region. Operation performed August 26, 1931, revealed a dilated superior major calyx containing a number of stones and, in the midportion of the kidney, posterior to the upper portion of the pelvis, a cystic sac 2 cm. in diameter which came off from, and was continuous with, the superior main branch of the renal artery. In the attempt to free this pulsating cystic sac, its rather friable wall gave way and a brisk hemorrhage occurred. The hemorrhage was quickly controlled by digital pressure on the renal artery. The author says, "We at once realized that we were dealing with an aneurism of the renal artery which had been causing considerable compression of the middle portion of the kidney, rather than with a calcified renal cyst. Whereupon total extirpation, instead of partial resection, of the kidney was decided upon because the nutrition of at least one-half of the renal substance was interfered with by this aneurism and the upper pole of the kidney had been destroyed by the hydrocalicosis containing calculi."

With regard to the prognosis, Mathé says that any true or false aneurism causing symptoms will ultimately result in death. When an aneurism is suspected, operation should be performed at once, particularly if pain, swelling, and hæmaturia are present. Of the thirty-six untreated patients whose cases are reported in the literature, all died, whereas of the seventeen subjected to nephrectomy sixteen survived.

MAURICE MELTZER, M.D.

The pregnancy was therefore interrupted and she was sterilized with the roentgen ray.

The author believes that the hemiplegia was due to a subcortical hemorrhage from a mechanical cause as there was no organic or toxic basis to explain it.

LEONARD T. LARSON, M.D.

### PUERPERIUM AND ITS COMPLICATIONS

Dachs, F.: The Clinical Value of the Bactericidal Index (Dokumente ueber den klinischen Wert des baktericiden Index) *Arch f Gynaek* 93: 547 547

In cases of puerperal fever attempts were formerly made to draw conclusions regarding the danger of infection and the prognosis from cultures of the uterine contents, but the results of such cultures were not satisfactory. By the Ruge-Philipp method it is possible to determine, according to whether the cultures appear in the first or the second plate, if the bacteria are very virulent or not.

In thirty-three cases of puerperal fever in which the Ruge-Philipp test was negative, there was only one death. This death occurred very late and was due to embolism. In forty-seven cases in which the Ruge-Philipp test was positive there were sixteen deaths, a mortality of 40 per cent. Of fourteen cases of carcinoma of the cervix in which the Ruge-Philipp test was negative an infectious complication developed in only one, whereas of eleven cases in which the Ruge-Philipp test was positive a serious infection developed in nine. Therefore a negative Ruge-Philipp test is reassuring and a positive test is alarming. However the test has only a relative value as it shows only that the relationship of the virulence of the bacteria to the resistance of the blood is unfavorable. Certain strains of streptococci will grow in every blood and others will grow only under favorable conditions. Only when we know the virulence of the individual strains can we determine the bactericidal power of the blood of the individual patient. When the bactericidal power of the blood is strong, the prognosis of a positive Ruge-Philipp test is more favorable than when the bactericidal

power of the blood is poor. In the cases of patients with a weak bactericidal power of the blood an attempt should be made to transfuse blood from a patient with a high bactericidal power. Tuberculous patients may have streptococci in their lung cavities. In diabetes, the bactericidal power varies greatly. In four cases of pyrexia of pregnancy the author found sometimes good and sometimes poor bactericidal power. It is noteworthy that the anesthetics commonly used increase the bactericidal power of the blood temporarily.

In the discussion of this report, PHILIPP (Berlin) stated that he directed his attention chiefly to the invading power of the bacteria, whereas Dachs shows a way of fighting the infection by overcoming the resistance of the bacteria by administering blood with a high bactericidal power. Philipp called attention to the fact that the Ruge-Philipp test is of value only for streptococci whereas an infection may be due to anaerobic or other putrefactive bacteria. In carcinoma of the cervix, infection is due almost entirely to streptococci. If a biopsy is done in the case of a woman with virulent streptococci in a carcinoma of the cervix, the patient will react with fever. If a Wertheim operation is done, death will result from a fulminating sepsis or peritonitis. Carcinoma of the cervix is therefore a criterion as to whether it is possible to overcome streptococcal infection and render the patient operable by the transfusion of blood with a high bactericidal power.

SCHULTZ (Hamburg) stated that the Schottlander virulence test gives information regarding the bactericidal power of the blood. While bacteria of the coliform bacillus and typhoid bacillus group are killed quickly in the blood, some of the groups of streptococci and staphylococci are resistant to the blood. *S. viridans*, the streptococcus pyogenes hemolyticus is never killed by human blood. In a case of streptococcus infection in which Schultz transfused bactericidal blood, there was no weakening of the cultures of streptococci. Schultz believes that only very rarely does transfused blood possess a greater bactericidal power than the patient's own blood.

A. ROSENCRANTZ (C)

method was found to be simpler and less severe than Leriche's surgical sympathectomy and to give the same results as the latter procedure. However, Lucchese warns that it should not be used on the genital organs for the purpose of rejuvenation as he has seen serious changes in the genital organs from isophenalization of the spermatic cord and testicles.

AUDREY GOSS MORGAN, M D

Ferguson, R S. Cancer of the Prostate. *Am J Cancer*, 1932, xvi, 783

Ferguson believes that cancer may arise in any part of the prostate or its accessory lobules.

On the basis of the symptoms, pathological features, and course of the disease, he divides the cases into the following three groups:

Group A. In this group the condition runs a relatively benign course. Over two-thirds of the patients survive more than three years and many of them live for from five to ten years without treatment. The average age at which the condition develops is slightly beyond sixty-five years. Symptoms of urinary obstruction are prominent and the amount of residual urine is large. Metastases are rare. As a rule there is no pain other than that due to retention. In many cases the condition is diagnosed clinically as benign hypertrophy and is not recognized until after removal of the tumor. The neoplasm is an adenocarcinoma with more or less perfect alveolar arrangement. Permeation of the lymphatics occurs late and metastasis to the bones is unusual. The diagnosis may be missed because of the absence of the hardness characteristic of cancer, but relief of the urinary obstruction by catheterization or treatment with the X-ray may relieve the edema to such an extent that on subsequent examination the diagnosis may be made readily.

Group B. In this group the author classifies cases of intermediate gravity. In such cases survival averages eighteen months and varies from seven to thirty-six months. The average age at which the neoplasm develops is between fifty-five and sixty-five years. The residual urine is moderate in amount. Pain is a prominent symptom. Urinary symptoms are distressing, difficult, and frequency being marked. As a rule the original symptoms are urinary and are soon followed by pain, loss of weight, and weakness, indicating rapid extension of the disease. Histological examination of the tumor shows that it arises most frequently from a small fibrous prostate which has long been the site of interstitial prostatitis. The growth rapidly invades the stroma, producing a small, stony hard, irregular mass which is easily felt with the examining finger. The early onset and high incidence of perineal, sacral and sciatic pain is due to early invasion of the lymphatics.

Group C. In this group are the cases showing the highest degree of clinical malignancy. The average survival after recognition of the disease is about six months. The average age at which the condition develops is fifty-five years. The amount of residual urine is usually low. Pain and widespread bone and

visceral metastases are the rule. The neoplasm is of a small-celled variety almost indistinguishable from round-cell sarcoma. The lymphatics in the prostate are uniformly invaded, and in 36 per cent of the cases the small veins are thrombosed by tumor.

The author discusses the various methods of irradiation therapy. From the standpoint of irradiation he divides the cases into two clinical groups, those suitable only for palliative therapy and those suitable for radical therapy. In the former, the tumor is more than 5 cm in diameter and metastases are demonstrable or probable. Palliation may be secured by external irradiation alone. In the latter, the tumor is less than 5 cm in diameter and metastases are improbable. A lethal tissue dose requires the use of both external and interstitial irradiation. For interstitial irradiation the author uses gold seeds applied through a suprapubic opening with a special instrument.

HENRY L SANFORD, M D

Colston, J A C, and Lewis, L G. Carcinoma of the Prostate. A Clinical and Pathological Study. *South M J* 1932, xxi, 696

The authors state that in carcinoma of the prostate radical operation is feasible only when the diagnosis is made early. Therefore the possibility of malignancy should be borne in mind whenever marked areas of induration are found.

Cases of malignancy of the prostate may be divided into the following groups:

- 1 Those suitable for radical operation
- 2 Those without marked urinary obstruction but too far advanced for radical operation. In these X-ray or radium irradiation may inhibit or cause some retrogression in the growth.
- 3 Those with varying degrees of obstruction. In these, the condition may be relieved by local and radium therapy.

For temporary relief, the punch operation and perineal prostatectomy have proved of value. The authors condemn permanent suprapubic cystostomy except for emergencies and palliation.

DONALD K HIBBS, M D

Bumpus, H C, Jr. Transurethral Prostatic Resection. *Brit J Urol*, 1932, iv, 105

Of the 250 cases on which this report is based, the Bumpus modification of the Braasch cystoscope with attachments for prostatic resection was used in 154 (61.6 per cent). Bumpus states that although he has tried many of the new instruments which have become available, with none is he able to remove tissue as rapidly and with as little destruction of the remaining tissue by coagulation as with the tubular knife followed by electrocoagulation to control bleeding.

The urethra being well dilated and lubricated, the instrument is introduced, and after the obturator is withdrawn the electrode guide which carries the short tubular shield for closing the fenestra is passed, the instrument being thereby converted into a direct

Trattner H. R.: Graphic Registration of the Function of the Human Ureter with the Hydrophorograph. Considerations in Physiology and Pathological Physiology of the Ureter. *J Urol* 93: xviii.

The author describes a new instrument, the hydrophorograph, for recording the function of the upper urinary tract and reports the findings of studies of human and dog ureters with regard to normal peristalsis, antiperistalsis, and spasm, amplitude, rate, and rhythm of contraction, and reaction to various types of stimuli. Their experiments have demonstrated the following four levels at which pressure changes show a marked change of activity:

1. The appearance level, where contractions first appear, from 0 to 5 cm. of water pressure.
2. The contraction level, varying from 3 to 18 cm. of water pressure.
3. The crucial level, above which any increase causes a marked reduction in amplitude.
4. The disappearance level, varying from 38 to 70 cm. of water pressure.

The motor power of the ureter is determined by injecting from 5 to 10 c.c.m. of normal saline solution into the upper ureter and the renal pelvis. The response is designated as very strong, moderate, feeble, or absent. This test is employed to determine the presence of mechanical obstruction. When increased intra-abdominal pressure or manual pressure over the kidney is transmitted to the field in the manometer the presence of dilatation is definitely established.

The method is of value to determine whether renal damage is taking place in nephropathy and to determine the effect of toxine and inflammation on the ureter. It is of aid also in the choice of cases for transplantation of the ureter as active peristalsis to maintain the normal flow of urine is of importance in the prevention of ascending infection.

ANDREW McNALLY, M.D.

## BLADDER, URETHRA, AND PROSTATE

Witten: The Prognosis and Treatment of So-Called Anfil Tumors of the Bladder (Die Prognose und Therapie der sogenannten Anfilomenen der Blase). *Wochenschr. f. d. deutsch. Chir. u. Gyn.* 92: 22.

Up to the present time there have been no extensive statistics on the end-results of the anfil tumors of the bladder which were first described in 1895. On the basis of the histological findings these neoplasms are classed as malignant carcinomas, but from the standpoint of prognosis they differ from very malignant cancers of the bladder.

Of the eighty-five patients with anfil tumors of the bladder who were observed in the anfil factories in Ludwigshafen in the period from 1903 to 1931 fifty-nine have died. Ninety-five were operated upon. Of the fifty-nine who died, not all died from the tumor. Many of these were more than fifty years of age when they became sick and died from some other disease. Of the twenty patients who were

not operated upon, one would not consent to operation and in two the tumor was too far advanced for surgical treatment.

In cases of small tumors the operative treatment consisted of electrocoagulation, and in cases of large tumors it usually consisted of partial resection of the bladder. Total resection was done only twice and in both instances failed to save life. In twenty-six cases the length of survival after the operation ranged from nine months to twenty-six years. Twenty-three of the patients were alive after three years, nineteen after five years, and eleven after twelve years. Frequently several operations were necessary. One patient was operated upon seven times. Of those operated upon more than once, thirteen were alive after three years, six died soon after the last operation, and ten died later.

In comparing the length of survival in cases of anfil tumor and other types of cancer of the bladder it was found that of the patients treated for anfil tumor 54 per cent were alive after three years as compared with 51 per cent of those treated for cancer of some other type, and 48 per cent of those treated for anfil tumor were alive after five years as compared with 50 per cent of those treated for cancer of another type. Therefore, in spite of the similarity of the histological picture, the prognosis of anfil tumors of the bladder is the more favorable. Metastasis was suspected in only one case. Even some of the patients who were not operated upon survived for six years. These were treated by roentgen irradiation. As a rule anfil tumors respond well to radium and roentgen irradiation. In investigations carried out at the Occupational Hygiene Institute it was found that the infectious agent producing anfil tumors of the bladder enters the body through the respiratory tract. Measures instituted on the basis of this finding have rendered it possible to eliminate the noise from the atmosphere of the factory rooms completely. Therefore in the last four years no more cases of anfil tumor of the bladder have been observed in Ludwigshafen. As the tumors frequently do not develop until after a period of twenty years, the symptoms are often first noted after the workers have been discharged.

In the discussion of this report, FRIEDMAN cited experiments on seventy rabbits in which anfil cysts were injected subcutaneously. In seven of the rabbits papillomata and other tumors of the bladder were produced.

STERNBERG (C).

## GENITAL ORGANS

Loebbecke, G.: An Experimental Study of Chemical Sympathectomy with "Isophenal" and Its Effects on the Male Genital Glands (Röntgenexperimentelle und anatomische Studien über "Isophenal" und seine Wirkung auf die männlichen Geschlechtsorgane). *Archiv. f. klin. u. exp. Med.* 193: 213.

Loebbecke reports experiments on dogs and rabbits in which Doeppfer's operation—chemical sympathectomy with isophenal—was performed. The

# SURGERY OF THE BONES, JOINTS, MUSCLES, TENDONS

## CONDITIONS OF THE BONES, JOINTS, MUSCLES, TENDONS, ETC

King, D. Osteochondritis Dissecans. A Clinical Study of Twenty-Four Cases. *J Bone & Joint Surg*, 1932, vi, 535

Of the twenty-four cases of osteochondritis dissecans reviewed by King eighteen were operated upon. Twenty knees and four elbows were involved. In five cases there was bilateral involvement. From the standpoint of the clinical history the cases of knee-joint involvement could be divided into three groups. In the first group were four cases in which the joint was painful, swollen, and tender and was locked in flexion for a few days following a slight injury. In the second group were two cases in which the condition was asymptomatic and was found on roentgen examination of the knee for comparison with its mate. In the third group which was made up of fourteen cases, there was a history of functional disturbances for two or three years. Soreness, pain on weight-bearing, "giving way," and stiffness were common symptoms, and a history of locking was frequent. Five of the patients had felt loose bodies in the joints. In the four cases of involvement of the elbow, the condition was associated with pain, stiffness, and weakness. In one case there was a dormant osteochondritis of the other elbow.

In eight cases the joints appeared normal. In the others the increase in fluid, tenderness, and flexion deformity varied greatly. Free bodies and elevation of the temperature were occasional findings. In only one case was the nature of the condition suspected before a roentgenogram was taken. In nineteen of the twenty knees there were lesions of the posterolateral aspect of the medial condyle of the femur. In the elbows the foci were in the capitulum. When the condition had been present for a long time secondary osteo-arthritis was a frequent complicating factor. Loose bodies had a tendency to migrate to "quiet areas," where they usually remained and often became firmly attached. In nine knees operated upon radically from two to six years ago, excellent results were obtained in six, good results in two, and fair results in one. "Slumbering" cases healed spontaneously.

WALTER P. BLOUNT, M.D.

Hadjopoulos, L. G., and Burbank, R. The Correlation of Experimental Streptococcal Arthritis in Rabbits with Chronic Rheumatoid Arthritis. *J Bone & Joint Surg*, 1932, xiv, 471

By incubating the whole joint the authors were able to demonstrate the presence of streptococci in practically all lesions associated with chronic

atrophic arthropathies. These organisms were found in every part of the synovial tissue where pathological changes could be detected. While they could not be demonstrated in compact bone, the spread of infection in bone tissue could be traced step by step through the medullary and haversian vascular supply. In the avascular cartilage the spread of streptococci occurred through infected bone tissue and by



Fig 1 Demonstration of streptococci in tendons. Streptococci invading the tendon indicated by arrows

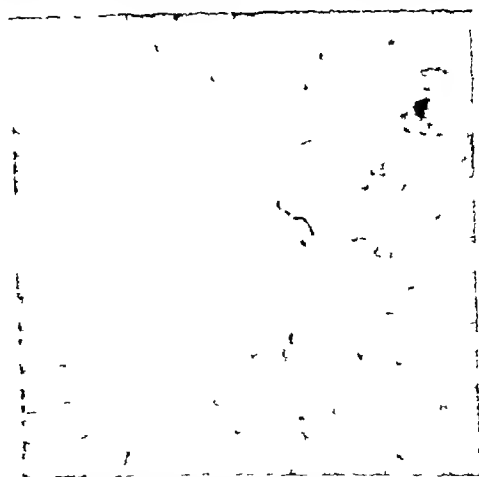


Fig 2 Demonstration of streptococci in the interlobular connective tissue of the liver



cystoscope. The prostatic urethra from the verumontanum to the trigone is carefully examined to determine what portions of the enlarged lobes of the prostate gland are obstructing the urethra and what their relationship is to other structures. On completion of this examination the guard sheath is withdrawn and under full vision the portions of the obstructing tissue are forced into the lumen of the sheath through the fenestra. When they are thus grasped, the multiple needle electrode is thrust through the base of the projecting tissue and the high frequency current is allowed to flow long enough to electrocoagulate the tissue so that the tubular knife is to follow. The object is not completely to desiccate the tissue to be excised, but simply to render ischemic the course of the knife and thereby diminish bleeding. When this has been done, which requires about ten seconds, the needle electrode is withdrawn and the obstructing tissue is excised with the tubular knife.

If bleeding follows this excision, the single electrode guide is again placed in position and the bleeding vessels are electrocoagulated individually the procedure then being repeated.

The amount of bleeding encountered during resection varies greatly with the different types of tissue removed. Care must be exercised to see that the tubular knife is very sharp as torn mucosa bleeds freely and bleeding from a tear is more difficult to control than bleeding from a clean cut.

It is preferable, when the operation is complete, for the irrigating fluid to be a little pinkish, for if coagulation has been continued too long the wash water is clear.

Since excessive postoperative bleeding is usually due to the accumulation of clots, a catheter of large caliber should be placed in the urethra immediately after the operation. This assures emptying of the

bladder favors coagulation, and allows the passage of any clots that may form.

Failures are usually due to failure to remove sufficient tissue to permit the bladder to empty completely.

It seems advisable to confine the procedure to the removal of only sufficient tissue to give an adequate channel from the bladder to the verumontanum so that on completion of the operation, it is possible, with the instrument at the verumontanum, to look directly into the bladder at the level of the trigone.

Of the 350 patients operated upon in the period between January 1, 1925 and January 1, 1931, 9 underwent prostatectomy subsequently and 15 underwent prostatectomy previously.

Six of the patients died while they were under observation at the Mayo Clinic. Infection rather than hemorrhage is likely to be the cause of death.

Whenever possible, the operation should be completed in 1 stage. If the amount of obstructing hypertrophied tissue is too great to be removed completely at 1 time, prostatectomy is almost always preferable.

In some cases, transurethral resection being associated with less risk, it is advisable to perform a multiple transurethral resection. The results of transurethral resection as well as those of prostatectomy are most satisfactory in cases of benign adenomatous hypertrophy of the prostate and next most satisfactory in cases of adenocarcinoma. Where the obstruction is due to prostatitis and only inflammatory tissue is excised at the time of resection the results are apt to be disappointing.

If 46 patients subjected to previous cystostomy are excluded (such patients remaining under treatment longer for healing of the suprapubic wound, 66 per cent of the patients whose cases are reviewed remained in the hospital less than ten days.

In cases of muscular dystrophy the results have not been encouraging.

In a case of encephalitis which had reached the stage of coma a striking result was obtained. Treatment with parathormone was started because the spinal fluid showed a low calcium and a high phosphorus content. Improvement began ten days later, and the patient recovered completely. The spinal fluid showed an increase in calcium and a decrease in phosphorus.

WILLIAM ARTHUR CLARK, M D

**Carp, L. Tennis Elbow (Epicondylitis) Caused by Radiohumeral Bursitis. Anatomical, Clinical, Roentgenological, and Pathological Aspects, with a Suggestion as to Treatment. Arch Surg, 1932, LXXI, 905**

The condition called "tennis elbow" (epicondylitis, epicondylalgia) occurs in adults as a result not only of sports requiring the use of a racket (tennis, squash, court tennis), but also of others such as golf and baseball, and of constant lifting and sudden flexion and extension of the elbow such as is required of pressers of clothing, salesmen carrying grips, violinists, blacksmiths, telephone operators, and housewives. It may be due to direct trauma over the lateral aspect of the elbow. It is frequently diagnosed as a sprain or rheumatism. It is characterized by pain and tenderness, and sometimes by swelling and heat in the region of the lateral epicondyle. The pain may be of a sudden, short, darting character causing quick cessation of the movement involved in its production or may be dull and constant and radiate to the arm or forearm and hand. It is often increased by extension at the elbow and pronation, supination, and tight flexion of the fingers, and sometimes is relieved by extension at the wrist. As a rule there is weakness of the extensor muscles of the forearm with weakness of the hand grip and difficulty in lifting. Patients afflicted to a severe degree with this condition are helpless and become impatient because of recurrence of the symptoms after remissions of weeks, months, or years. The symptoms and signs are far more marked than would be expected from the pathological anatomy.

The author gives a brief review of the history of the condition. The causes to which it has been ascribed include periostitis of the epicondyle, myofascitis of the extensor origins, radiohumeral bursitis, arthritis of the radiohumeral joint, a tear in the muscular portion of the extensor carpi radialis longus, involvement of the capsule of the elbow joint, involvement of the subcutaneous fat and fascia and the periosteum of the epicondyle, malalignment of the head of the radius and the lower end of the humerus, adhesions, and fixation of the head of the radius in the normal range of motion.

Among the treatments proposed are rest, physical therapy, manipulation, excision of the radiohumeral bursa, methods to relax the extensors such as strapping of the forearm and the use of a cock-up splint, roentgen therapy, excision of the subcuta-

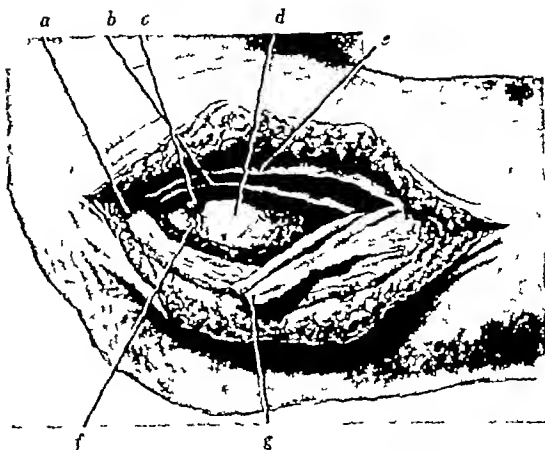


Fig 1. Drawing of a dissection showing the radiohumeral bursa in relation to the surrounding structures: *a*, origin of conjoint tendon from epicondyle; *b*, divided tendon; *c*, radiohumeral bursa; *d*, capsule over radial head; *e*, divided extensor tendon; *f*, radiohumeral joint; *g*, tendon and muscle cut from epicondyle.

neous fat and fascia and of the periosteum of the epicondyle, and infiltration of the tender tissues with procain hydrochloride in saline solution.

The author states that it is difficult to ascribe an individual case of tennis elbow to any particular cause unless this cause is proved. In general, an involved conjoint tendon at the epicondyle or its movement or strain in the presence of an inflamed structure or structures in close proximity may produce tennis elbow. The nearby structures that may become inflamed are the radiohumeral bursa, the epicondyle, the conjoint tendon at the epicondyle, the capsule of the elbow joint, the radiohumeral joint, and the radial nerve.

Carp states that the radiohumeral bursa exists, probably adventitiously. He has seen it on the dissecting table. It is difficult to discover in a routine dissection. It lies beneath the conjoint tendon, just below the epicondyle and over the radiohumeral joint. Normally, it measures about 1 by 0.5 cm and its walls are very thin and fragile. It may appear only as a slight depression or elevation, and when incised is usually found to contain a little clear fluid. Pathologically, its approximate position is demonstrated by the shadows due to calcification in which the bursa encroaches on the epicondyle or extends over the head of the radius. The author presents clinical, roentgenological, therapeutic and pathological evidence to show that involvement of the radiohumeral bursa may produce tennis elbow.

Eight cases of radiohumeral bursitis in which excellent results were obtained from different types of therapy are reported. Five of the patients were males. The lesion was due to direct trauma in two cases, indirect trauma in three, combined direct and

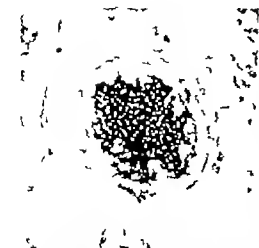


Fig. 3. Demonstration of streptococci in hepatic vessels. Low-power magnification of a thrombus-like mass in a liver vessel, probably the portal vein.



Fig. 4. Demonstration of streptococci in hepatic vessels. Under high magnification (x60) the thrombus-like mass is found to be made up of collections of bacteria, streptococci.

Figs. 3 and 4. The authors think that during the period of artificial incubation the bacterial mass originated from a streptococci embedded in the endothelium lining of the portal vein. They have never encountered similar picture in cases not subjected to previous infection.

synovial infiltration. In normal joints subjected to the same procedure the findings were negative.

In similar studies of the tendons and tendons in the immediate neighborhood of arthritic joints, streptococci were demonstrated in the tendons at the site of nuclear proliferation, and the muscles

were found to be extensively infiltrated with streptococci at their sheaths. However in spite of past cure, the possibility of external contamination in surface areas must be considered.

Throughout this study the progress of the disease could always be traced directly to the terminal blood vessels, as in all infections of hematogenous origin. Despite the specific selectivity of the antistreptococcal streptococci used in the experiments, internal organs, especially the liver and kidneys, were not exempt from pathological changes of a toxic nature involving their parenchyma. Nevertheless, streptococci could be demonstrated in the interlobular connective tissues of the liver and occasionally also in the hepatic vessels. This fact is highly significant as it demonstrates that chronic rheumatoid arthritis is fundamentally a systemic disease, and it explains the transient septicemias that occur intermittently in the course of the infection. **FRANK LEVINE, M.D.**

**Brodie A. Day: Monarticular Arthritis Resembling Tuberculosis. A Clinical and Pathological Study of Twenty Four Cases. Arch. Surg. 1924, 87: 54.**

In the period from March, 1914, to January, 1924, twenty four cases of monarticular arthritis resembling tuberculosis were operated upon in the New York Orthopedic Hospital. The chief purpose of the operation was to establish the diagnosis. A careful tissue examination was made in all of the cases and a guinea pig test in all except one. The picture of tuberculosis was excluded in every instance.

Monarticular arthritis closely simulating tuberculosis is not uncommon. It cannot be differentiated from tuberculosis by physical or roentgen-ray examination. A repeatedly negative Mantoux test is suggestive but not conclusive. Exploratory operation is the only means by which the diagnosis can be made, and even when this is done the gross appearance of the joint cannot be relied upon entirely. The histological picture is that of a chronic infectious reaction. Cultures on ordinary media are negative.

Most patients recover without further treatment after the operation. **FRANK LEVINE, M.D.**

**Warner, E. C., and Thompson, A. G.: Investigation and Treatment of Certain Cases of Disease of the Muscle and Nerve. Proc. Roy. Soc. Med. Lond., 1924, 17: 13.**

The authors report a study of the relation of the parathyroid hormone to the metabolism of calcium and phosphorus in chorea and in progressive muscular atrophy and other neuromuscular diseases. The best criterion seems to be the calcium content of the cerebrospinal fluid. This has been increased appreciably by the administration of a c.c.m. of parathyroid. Six out of seven cases of progressive muscular atrophy showed a low calcium content and three out of five cases showed a high phosphorus content of the cerebrospinal fluid. Under treatment with parathyroid, five of seven patients showed improvement. Two have become able to resume their ac-

In the early stages of osteochondritis, the upper or lower vertebral margins are thinned and present a wavy appearance or irregularities due to the pressure of the diseased cartilage plates. In the later stages, definite defects may occur in the vertebral bodies as the result of localized destruction from pressure produced by the released nucleus pulposus.

In osteo-arthritis the hypertrophic changes produce new bone which may bridge the intervertebral space. In advanced stages the vertebral bodies are flattened.

The author states that in the cases of persons more than forty years old caution is necessary in making a diagnosis of definite vertebral disease as most persons beyond middle age show changes in the vertebrae due to posture or occupation.

Disturbance or rupture of the nucleus pulposus of the intervertebral disk may produce a sharply localized defect in a vertebral body or the deformity characterized by increased concavity which is known as "fish spine."

Metastatic malignancy is common in the vertebrae. The tumors most frequently forming spinal metastases are hypernephromata, carcinomata, sarcomata, and endotheliomata. The general roentgen picture of metastatic malignancy in the vertebrae is that of irregular areas of rarefaction. Metastases from carcinoma of the prostate sometimes increase the density and do not change the contour of the involved vertebra, but most other metastases finally result in collapse of the vertebral body.

WILLIAM ARTHUR CLARK, M D

Pomeranz, M M. Intrapelvic Protrusion of the Acetabulum (Otto Pelvis) *J Bone & Joint Surg*, 1932, xiv, 663

The author defines Otto pelvis as a non-traumatic, chronic, progressive arthritis of the hip joint with intrapelvic protrusion of the acetabulum and the head of the femur. This condition was originally described in 1824 by Otto, who characterized it as an abnormal gouty manifestation. Pomeranz tabulates the sex enty-nine cases which have been reported in the literature.

Differences of opinion regarding the condition have been due chiefly to (1) the wide range of factors to which it has been attributed, and (2) variations in the pathological findings reported. If numerous transitional forms occur, as is believed by some investigators, opinion might easily be influenced by the particular stage during which the process is observed. The great majority of those reporting on the condition believe it is not a disease entity.

The chief complaint in the average case is a slowly progressing painful coxitis which has been present for months or years. When the deformity is great and the condition has been present for a long time, all movements of the hip are restricted.

Even in early cases the diagnosis may be made by roentgen-ray examination. The protrusion of the acetabulum varies from a few millimeters to 4 or 5 cm. As the acetabulum migrates, it inclines up-



Otto pelvis, bilateral involvement. Note the irregularity of the inner surface of the left acetabulum as well as of the head of the femur. Almost complete synostosis of the right sacro-iliac joint.

ward, inward, and forward, so that it may project above the ramus of the pubic bone and extend toward the obturator foramen. In extreme cases the protrusion extends up to the sacro-iliac joint.

The inner wall of the acetabulum may be shell-like in thinness or dense and eburnated. As it extends into the pelvis, a low-grade osteoplastic process is initiated and the yielding joint is splinted by the formation of a dense wall on the inner aspect of the acetabulum parallel with its projecting margin. The external margins of the acetabulum project outward over the neck of the femur as irregular serrated vegetative formations.

In the typical deformity the integrity of the femoral head is preserved. As the head of the femur is submerged within the acetabulum the trochanters approach the lateral margins of the pelvis and incline posteriorly. The greater trochanter impinges on the lateral margins of the ilium in the region of the acetabular shelf, and the lesser trochanter approaches the ischium. This explains why the femur cannot be rotated outward or backward.

The author reports six cases. In summing up his discussion he states that two types of the condition may be recognized (1) an acute type, which is probably of infectious origin, and (2) a chronic type, which may occur in the course of any disease resulting in osteomalacia of the hip joint.

ROBERT C. LOVERGAN, M D

Massart, R. Chronic Non-Infectious Arthritis of the Hip Joint (*Les arthrites chroniques amicrobiennes de la hanche*) *Rev de chir*, Par, 1932, li, 162

A group of non-infectious lesions of the hip joint are described and their evolution is shown by roent-

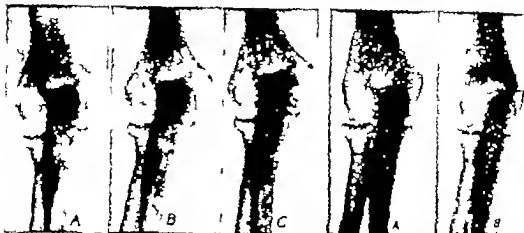


Fig. 2.

Fig. 3.

Fig. 2. Roentgenograms of left elbow in Case 1. A shows an irregular oval shadow just lateral to the epicondyle. This shadow represents a calcified radiohumeral bursa beneath the coracohumeral tendon. It was taken immediately after the bursa had been ruptured by digital pressure producing prompt relief. Note disappeared and latent shadow just lateral to the epicondyle. C taken three days later. Note the almost complete disappearance of the shadow seen in B.

Fig. 3. Roentgenograms of elbow in Case 7. In View A note the shadow over the epicondyle and radiohumeral joint. This represents a calcified radiohumeral bursa. View B was taken eleven months later. The shadow had disappeared as the result of absorption of the calcium deposits. Rest and physical therapy were used.

(Corp. Trauma Elbow Caused by Radiohumeral Bursa)

indirect trauma in two, and questionable trauma in one. Swelling was present over the bursa in five cases and the roentgen findings were positive in five. In one case operation revealed a calcified radiohumeral bursa. In three cases absorption of calcium deposits occurred spontaneously. In four cases the treatment consisted of manipulative rupture of the bursa.

Prompt relief may be expected from rupture of the bursa by firm digital pressure applied over the epicondyle and radiohumeral joint. When this procedure is very painful the induction of general anesthesia is advisable. Operative therapy should be used only when conservative therapy fails to relieve prolonged or recurrent pain and disability.

H. EARLE CORWELL, M.D.

EVANS, W. A.: Abnormalities of the Vertebral Body. *Am. J. Roentgenol.* 1932, XXIV, 681.

A vertebra may develop without a body or with half a body or the bodies of two vertebrae may fuse completely or on one side only because of variations in the ossification centers. Such anomalies may be differentiated from traumatic lesions by the absence of reparative or irritative changes.

In rickets there is no deformity of the vertebral bodies which may be regarded as characteristic. However, in the active or first stage of the disease, the margins of the vertebral bodies usually have a frayed appearance. In the second stage, there are

coarse longitudinal striations with increased density and in the third stage marginal warts may be noted. At no time is there any collapse or fusion of the bodies.

In osteomalacia, the vertebral bodies have a lacunar or mottled aspect.

Fracture of a vertebral body is not proved conclusively by the demonstration of a wedge-shaped deformity. The diagnosis of fracture is justified only when certain variations in bone structure, texture, and outline are present in addition. The most common of the latter is bone condensation at the upper margin of the involved body.

In old fractures there is evidence of bone production such as bridging upward from a wedge-shaped body.

Tuberculosis produces collapse deformity which varies according to the site at which the disease is most progressive. In the late stages there may be bone regeneration and overgrowth.

In syphilis there is usually localized destruction from gumma followed in the later stages by a marked increase in the density of the vertebral body with variations in contour and extensive bony overgrowth at the margins.

Epiphyseitis is characterized by variations in the size, structure, and density of the bony portion of the epiphysis with more or less destruction of the adjacent structures and changes associated with a reaction resulting in loss of tissue detail in the region of the process.

had fallen backward. She experienced intense pain in the pelvis and the lower part of the abdomen and felt as if all of the abdominal contents had been thrown to one side of the abdomen. She was unable to walk. Since the accident she had been confined to her bed, although the pain had decreased in intensity. All of the active movements of the coxo-femoral joints were possible but very limited. Passive movements in all directions were complete but painful. The patient was unable to rotate her trunk or lie on her side.

When she was re-examined on March 9 she was able to rise from her bed and walk a few steps if supported. Examination of the posterior part of the pelvis and spinal column while she was standing revealed nothing abnormal. Intense pain was still present in the hypogastric region and at the symphysis. Vaginal examination disclosed a gap between the two pubic bones and a soft mass behind them, evidently a hæmatoma.

In order to be sure that this gap was due to a traumatic rupture, Dellepiane made a roentgen examination of the patient's pelvis and a roentgen study of the pubic bones of women of various ages and in various physiological and pathological conditions. The roentgenogram of the patient's pelvis showed a space of 1.7 cm. between the pubic bones at the lower end, of 1 cm. in the middle, and of 1.2 cm. at the upper end. Normally there may be a space of as much as 1 cm. between the bones in pregnancy or just after delivery. The space is larger in young women than in older women. As the authors' patient was forty-four years of age

and had never been pregnant, a diagnosis of traumatic rupture of the symphysis pubis was made. Complete recovery was expected.

AUDREY GOSS MORGAN, M.D.

Dickson, F. D. The Shelf Operation in the Treatment of Congenital Dislocation of the Hip. *Surg., Gynec. & Obst.*, 1932, 15, 81.

Before the fourth year of age, congenital dislocation of the hip can nearly always be reduced by closed manipulation. Between the fourth and ninth years, open reduction may be necessary. After the ninth year, ordinary reduction is usually impossible and the shelf operation may be indicated.

In the author's cases in which the shelf operation is to be performed skeletal traction is applied for two weeks to relax contracted structures. The operation is performed on a traction table. Traction is applied to both legs. The head of the femur is completely freed and by traction on both legs and leverage placed behind the neck of the femur the head of the femur is brought into a position above and slightly in front of the acetabulum. The legs are then abducted and the slack is taken up by more traction. A shelf of bone is turned down from the side of the ilium with a gouge and made to fit the upper part of the head of the femur like a cap. For re-inforcement, a wedge of bone taken from the iliac crest is placed above it. A cast including both hips is then applied and traction is maintained continuously for six weeks. At the end of the six weeks weight-bearing is started.

MAURICE L. DALE, M.D.

genograms. Arthritis may follow congenital dislocation of the hip not only in cases in which the dislocation is unreduced, but also in those in which proper and early reduction is obtained. The involved joint is badly deformed and very painful. The condition occurs most frequently in the third decade of life. The septic deformities described by the author include injuries sustained at childbirth, rachitic deformities, the *coxa vara* of adolescents, Legg-Calvé disease due to a disturbance of ossification, subluxation of the hip joint, and chronic joint changes following fracture. These are of great importance because of the great mechanical stress to which the hip joint is subjected.

GUERRE DE TAKATS, M.D.

### SURGERY OF THE BONES, JOINTS, MUSCLES, TENDONS, ETC

Juvara, E.: The Operative Treatment of Hallux Valgus (Le hallux-valgus son traitement opératoire). *Rev de chir* 1912, 2, 31.

Juvara says that we should seek the cause of hallux valgus in the skeletal structure. The changes in the tendons, ligaments and capsule are the result of the deformity. As the exostosis on the medial side of the joint may be absent even in marked cases, it can have no part in the causation of the condition. The head of the first metatarsal may be perfectly normal in form and size but the length of the bone is usually increased. The distal articular surface of the internal cuneiform faces in a more medial direction than is normal, causing a medial direction of the first metatarsal since it articulates with the cuneiform. This medial deflection is increased by the leverage of the great toe which is directed outward, the pull of its tendons causing a medial thrust of its base against the head of the metatarsal.

The treatment must be surgical. Any relief gained from plastic procedures on the skin or subcutaneous tissues alone will be only temporary. Tenotomy of the extensor tendon, reinsertion of this tendon into the proximal phalanx, transplantation of the long

flexor into the extensor on the medial side and other tendon operations are all insufficient for permanent cure. Operations on the head of the metatarsal, such as resection or reshaping, and the various forms of plastic operations on the capsule laterally, with the normal function of the joint, which has a unique construction for weight bearing and walking.

It is better to attack the shaft of the first metatarsal, either near the joint or in the midshaft. Of the wedging operations suggested—most of which are called by the names of the surgeons who devised them—all are performed near the distal or proximal end and all are designed to give the metatarsal an outward direction toward the second metatarsal. Operations on the shaft itself have been less successful.

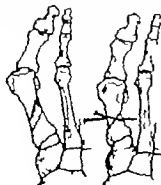
The author describes an operation which he has performed since 1910 in sixty cases. In this procedure the first metatarsal is sawed through in the midshaft obliquely from the lateral to the external side, from a proximal to a distal point, two cuts being made from 4 to 5 mm. apart. The anterior cut is made more oblique than the posterior osteotomy so that the section of bone removed is thicker at its external margin than at its internal margin. This section is discarded and the fragments of the shaft are approximated. When they are brought together exactly the bone points meet in an external direction, closer to the normal horizontal than formerly and is shorter. The fragments are fixed together securely by an encircling wire ligature which is kept from slipping by a pin. The pin traverses both fragments and prevents longitudinal displacement. The wire and pin are subsequently removed. No plaster cast is used as the lateral function is sufficient.

The deviation of the great toe is extreme, is corrected by pinching the joint capsule on the medial aspect. The shortening of the metatarsal relaxes the tendons so that they no longer pull the toe out of place. Also because of the shortening the shoe causes less outward pressure against the great toe. In fact, a shorter and narrower shoe can usually be worn after the operation.

The patient begins walking on the heels after about three weeks, and is able to return to his usual occupation after from six to eight weeks.

The article has sixty five illustrations.

WILLIAM ARTHUR CLARK, M.D.



Juvara's operation for hallux valgus.

### FRACTURES AND DISLOCATIONS

Corn, E., and Dellepiane, G.: Medico-legale Opuscolo Regarding Traumatic Rupture of the Suprascapular Pulse. A Roentgen Study of the Suprascapular Pulse in the Y-acetabulum (Pulsio suprascapularis per rottura traumatica della vena polmonare). *Radio radiologica della vena polmonare* (Lombardia). *Gazz. med.* 1912, 222, 18.

Corn was called on February 5 to see a woman who had been in an automobile accident on January 31. In the collision she had been thrown violently against the front seat of the automobile and the

and feet is increased constantly, but that it usually occurs in the cold and may be extraordinarily increased by emotional changes. Evaporation of the excessive perspiration may chill the extremity 6 degrees F below room temperature. Cases reacting in an exaggerated way to emotional stimuli are peculiarly suitable for sympathectomy.

The pre-operative tests described have been used also to determine the completeness of a sympathectomy. In a completely desympathectomized extremity novocain block does not change the rate of capillary circulation, foreign protein shock does not cause any further rise in the surface temperature, and sweating and gooseflesh are absent.

Of the patients with typical Raynaud's disease whose cases are reviewed by the author, all but two reported that they were relieved of vasospasm during the first six months after operation. The two with only partial improvement had such marked scarring and fibrosis of the extremities that the failure of the operation to be completely successful was due undoubtedly to mechanical occlusion of the terminal arteries and is explained satisfactorily by Lewis' theory of local pathological changes in the digital vessels. After the operation, emotional disturbances no longer caused vasospasm. Postoperative sweating tests showed complete absence of sweating in three cases and only slight sweating in the two in which improvement was incomplete. In all of the cases tested capillary observations during a febrile reaction demonstrated complete paralysis of the vasoconstrictor nerves.

In three cases the changes appear to be permanent and the patients have remained free from symptoms of Raynaud's disease. In the two cases of late failure following the operation sympathetic fibers were regenerated or other sympathetic connections took on the function of those destroyed at operation. In one case a second operation brought about striking improvement.

In summing up, the author says that resection of the two upper dorsal ganglia or of the second to fourth lumbar ganglia brought about immediate paralysis of sympathetic tonus in every case. Whereas lumbar sympathectomy was followed by permanent vasomotor paralysis the dorsal operation was followed by recurrence of sympathetic nerve function in two of the five cases reported and in five which were operated upon outside of the hospital by members of the Vascular Clinic. It is believed that inclusion of the inferior cervical ganglion in the operation will prevent recurrences of sympathetic nerve function in the upper extremity.

J EDWIN KIRKPATRICK, M D

Neuhof, H. Embolectomy with Partial Arterial Occlusion for Embolism of the Extremities. *Ann Surg*, 1932, xcvi, 44.

It is probable that restoration of the arterial stream occurs only rarely after embolectomy and arterial suture. So-called early operations for the removal of the emboli may, in fact, be late ones.

The causes of failure are already existing changes in the arterial intima at the site of the embolism, technical flaws at the time of operation, and the dislodgment of thrombi after operation.

The results of operation are usually regarded as successful when gangrene does not supervene, but that satisfactory results may be obtained without operation is indicated by the fact that after embolectomy restoration of circulation does not always occur.

Operation is indicated for embolism of the arteries of the extremities only when the diagnosis and localization are certain and the evidence points clearly to the likelihood of massive gangrene if the blockage is not relieved.

To reduce the chances of thrombosis and peripheral dissemination of thrombi after operation, the author advocates evacuation of the embolus and broad approximation of the arterial intima with resultant narrowing of the lumen. SAMUEL KAHN, M D

## BLOOD, TRANSFUSION

Woehlich, E. Progress in the Physiology and Pathology of Coagulation of the Blood (Fort-schritte in der Physiologie und Pathologie der Blutgerinnung). *Klin Wchnschr*, 1932, I, 118.

Our present-day knowledge regarding the physiology and pathology of coagulation of the blood is compared with the old so-called classical theory of the process. According to the older teachings, blood coagulation has two phases (1) the formation of the fibrin ferment or thrombin from the primary elements, and (2) changing of the fibrinogen dissolved in the plasma into insoluble fibrin under the action of the thrombin. By the delivery of thrombokinase when the blood comes into contact with a wound, the process of coagulation is especially hastened. Within the vascular system the blood remains fluid as the intact vessel wall exerts no irritation on the blood cells which causes them to liberate thrombokinase.

Up to the year 1906, purely chemical considerations prevailed in the teachings regarding coagulation of the blood. It was Iscivresco who first used modern colloidochemical methods and conceptions in the study of the process. In time the number of new hypotheses based on colloidochemical knowledge became even larger than the number of discoverers as some of the latter changed their opinions. Only the investigations of Schmidt on fibrinogen, fibrin, and thrombin are colloidochemical studies in the true sense of the word. These have refuted a large number of the newer hypotheses.

Recently, particular attention has been paid to the study of the coagulation of active cell substances variously called "cymoplastic substance," "thrombokinase," "cytozym," "thrombozym," and "thromboplastin." It is of interest that Freund, Zack, Bordet, and Howell, independently of each other and by different procedures, came to the conclusion that the active principle of the cell extract is a lipid. The old findings of Schmidt were thereby confirmed. This



# SURGERY OF THE BLOOD AND LYMPH SYSTEMS

## BLOOD VESSELS

Galli, R.: Spontaneous Rupture of the Popliteal Artery Caused by Indirect Trauma (Rottura spontanea della arteria poplitea da trauma indiretto). *Ann. Med. Chir.* 932, 12, 134.

The rupture of the popliteal artery reported by Galli occurred in a syphilitic man forty-eight years of age when he used his right knee in helping to lift a heavy bale of wool. It was followed by the clinical signs of a rapidly developing aneurism. At operation, both ends of the torn vessel were ligated. A year later the condition of the leg was excellent.

KELLGOS SMITH, M.D.

Albert, F.: Vein Ligation. An Experimental Study of the Peripheral Vasomotor Reactions (A propos des ligatures veineuses. Etude experimentale des reactions vaso-motrices peripheriques). *Lyon chir.* 921, 212, 275.

On the basis of experimental studies the author concludes that vein ligation produces a series of vasomotor responses in the corresponding limb. An active vasoconstriction takes place, which favors the development of collaterals. This peripheral response may be greatly modified by the pre-existing vasomotor tone. Therefore it is possible to obtain, as after sympathectomies, entirely different effects according to the pre-operative state of the vasomotors. The vasomotor reactions following vein ligation pass in part through anox reflexes in post-ganglionic sympathetic fibers. However a good part of such reactions is independent of extrinsic nervous control. The peripheral vascular bed is capable of reacting in the absence of nervous control to simple changes of intravascular pressure and also to physicochemical changes of the surrounding tissue.

GILLES DE TARTAG, M.D.

Glasser, N. and Scoppini, F.: The Treatment of Varices by Phlebocauterizing Methods (Sulla cura della varici con i metodi fibrocaterizzanti). *Ann. Med. Chir.* 93, 12, 75.

Following a review of the literature on the treatment of varicose veins by sclerosing methods, the authors discuss the indications and contra-indications of the different methods, describe the complications, and compare the results with those obtained by injecting sclerivate solutions into the sacs of aneurysms. Roentgen-ray examination with the use of Epiolol after the injection treatment of veins has been of aid in determining whether a cure (closure of the vessel) has been obtained.

Histological examination of fragments of injected veins disproves the theory that thrombosis alone is responsible for the closure of the lumen as it reveals

that the lumen is closed by a fatty proliferation of the intima and media with or without thrombosis.

The authors review the results obtained with sclerosing injections in severe and complicated cases of varicose veins. They believe that sodium oxydurate solutions are most efficient in preventing sclerosis and cause the least untoward reaction.

In conclusion they record good results in the treatment of hemorrhoids by the injection of sclerosing solutions and electrocoagulation.

KELLGOS SMITH, M.D.

White, J. C.: Raymond's Disease. *The English Medicalist*, 1927, Oct., 1194.

As defined by the Circulatory Clinic of the Massachusetts General Hospital, Raymond's disease is a form of peripheral vascular disturbance caused by tonic contraction of the smaller arteries in the extremities without obvious pathological changes in the walls of the vessels. It commonly involves symmetrical areas in the hands or feet, causing excessive perspiration and circulatory stasis with periods of cyanosis or pallid asphyxia. In severe cases the condition goes on to dry gangrene of the phalanges. The spasm is bilateral and occurs on exposure to cold and during emotional disturbances. It involves only the terminal arteries, the small vessels controlling their normal pulsations. The disease occurs most commonly in young persons with a hyperirritable nervous constitution.

White reports the cases of five patients who have been followed over periods of from nine to thirty-four months. Before operation was attempted in these cases tests were carried out to determine whether interruption of the sympathetic nerves would restore the normal circulation. By certain methods of injecting novocain the vasoconstrictor nerves can be blocked in the spinal cord, the paravertebral ganglionated trunk, or the main peripheral nerves of the extremities. The novocain injections cause a temporary increase in circulation which is exactly comparable to that brought about by operative removal of the vasoconstrictor fibers running in the sympathetic nervous system. Porphyria album produced by typhoid vaccine causes a marked increase in the peripheral temperature in cases of Raymond's disease, but only a slight response in cases of arterial occlusion. Direct observation of the capillaries with a capillary microscope in cases of Raymond's disease shows that the capillaries are normal in number but many of them are dilated or misshapened, and that under emotional stimulation extraordinary fluctuations occur in the rate of circulation. In studies of the degree and distribution of sweating in these cases it has been found not only that the sweating of the hands

many failures of properly performed transfusions. The circulatory failure in collapse particularly the hæmorrhage into the abdominal vessels, differs from external hæmorrhage.

The author's experiments have shown that infusions of blood serum are less efficacious than the transfusion of fresh blood. The heart seems to depend most upon the degree of filling of the vessels and the respiration depends most on the breathing surface, that is, the erythrocytes. Kallius reported a striking result from the infusion of 700 c cm. of donor's blood in hæmorrhagic respiratory failure. In the replacement of lost blood it is necessary not only to maintain the blood pressure but also to sustain the respiration. In very severe hæmorrhages, the transfusion of blood is indispensable for the saving of life, at least up to a certain point. When the primary effect has been obtained, other fluids such as homologous serum may be employed without hesitation. Obviously, blood transfusion provides the body with valuable building material primarily hæmoglobin and colloids. In addition it stimulates the blood-forming organs and protects tissues by blocking the destructive processes. The administration of hæmoglobin in the form of a dilute solution of blood has proved very valuable. The author uses every blood clot and extracts blood-soaked compresses with salt solution in order to restore every possible drop of blood to the body.

K. HEIM (G)

Polayes, S. H., and Lederer, M. Reactions to Blood Transfusion. *J. Lab. & Clin. Med.*, 1932, **xvii**, 1029.

From a study of 2,500 transfusions the authors conclude that reactions to blood transfusions are the result chiefly of incompatibility due to errors in the grouping of the blood caused by a poor technique, the use of weak or contaminated sera, weak agglutinins or agglutinogens in the recipient's blood, pseudo-agglutination characterized by rapid sedimentation of the red cells, such as is frequently seen in pregnancy and sepsis, auto-agglutination in which the red cells are agglutinated by the patient's own serum a phenomenon which may be avoided by testing washed red cells, contamination of the recipient's blood by bacteria, the indiscriminate use of the universal donor, and the development of iso-antibodies and hæmolysins in the plasma of persons receiving previous transfusions of compatible blood.

Other causes are the use of unclean apparatus and of citrated blood, incipient coagulative changes produced in the transfused blood before it enters the circulation by the agitation and whipping incident to its withdrawal, allergic phenomena in the recipient, the production of ill effects on the kidney, the cause of which is not understood, overtaxation and overdistention of a diseased heart, and the transmission of disease to the recipient.

HAROLD M. BRILL, M.D.

thermostable lipoid was obtained by the individual investigators in various ways. Of particular importance is the heparin found by Howell in his attempts to produce antithrombin. Howell named this substance "heparin" because of its origin in the liver. Even in exceedingly small doses it hinders blood coagulation and also is the it may render the blood incoagulable for some time. It is entirely non-toxic and has been found of value in clinical cases in attempts to wash the blood by dialysis.

The recently disputed theory that under normal conditions thrombin is formed only in the presence of calcium ions was proved conclusively by Weeßhach and Paschke in plasma and in serum from which calcium was removed by dialysis. From the numerous reports it is evident that the nature of thrombin remains as unknown as that of prothrombin. However it may now be regarded as proved that fibrinogen is a protein body exhibiting all of the properties of globulins. The principal site of formation of fibrinogen is probably the liver. True fibrinogen is not identical with a solution of fibrin in weak alkali. Moreover acid coagulation of fibrinogen and spontaneous coagulation of blood are not related.

The most disputed questions in blood-coagulation investigations are whether the process of coagulation of fibrinogen by the thrombin is a fermentative process and whether thrombin is to be considered a true ferment. The opponents of the ferment theory must prove that thrombin is not a catalyst but is contained in the fibrin as an essential chemical or physicochemical constituent of the end-product of the reaction and therefore—not by a simple process of adsorption—is utilized in the reaction with the fibrinogen. Recent investigations seem to prove that the thrombin is a strictly specific catalyst of the denaturing process of the fibrinogen, which also always occurs spontaneously and that the fibrin produced by thrombin coagulation and by spontaneous coagulation are identical protein substances.

In the second part of the article the author discusses the advances which have been made in the pathology of blood coagulation. Marked delay of blood coagulation is the principal characteristic of hemophilia as compared with hemorrhagic diseases, in which latter the rate of coagulation seems usually to be almost normal. On the other hand, the fact that hemophilic blood, although it coagulates slowly undergoes coagulation ultimately distinguishes hemophilia from peculiar diseases characterized by complete inability of the blood to coagulate, which has been called "pseudo-hemophilia." In true hemophilia the fibrin content of the blood is entirely normal. It is very evident that the disturbance in this condition is to be sought in the first phase of coagulation of the blood. The first positive finding concerns the thrombocytes. While the number of thrombocytes in hemophilic blood is normal, the coagulation of hemophilic blood is less accelerated by the addition of an emulsion of hemophilic thrombocytes than by the addition of normal thrombocytes. Opposed to the cellular theory of the

disturbance of coagulation in hemophilic blood is the theory of von Felsky that the cause of the delay of coagulation is to be sought in the plasma constituents of hemophilic blood. However the plasma and cellular theories of hemophilia are not necessarily contradictory since in a disturbance of the blood-coagulation system there must be also pathological changes in the capillary system.

Recently in experiments on animals, Le Flier Birch demonstrated a relationship between hemophilia and the female sex hormone. The fact that women transmit hemophilia, but are not affected by it themselves he explains by the assumption that they are protected from it by the female sex hormone. Therefore this hormone, which is demonstrable also in the urine of normal men, must be absent in hemophilia.

The author next discusses coagulation of the blood in hemorrhagic diseases and gynecological conditions. The long recognized incoagulability of menstrual blood has not been explained in spite of numerous investigations. The blood coagulation in disturbances of liver function is best explained by Doyon's theory that the liver has an important part in the preparation of fibrinogen. The coagulation of the blood in disturbances of thyroid function and in other pathological conditions such as tumors and infectious diseases has been the subject of numerous investigations without definite results.

H. STRICKER (2).

Holtzsch, E.: Blood Loss and Blood Replacement (Blutverlust und Blutersatz) *Neuhandels / Gynäkisch. Gynäk. 932* 1921, 24.

In man, the total amount of blood constitutes about 6.7 per cent of the body weight. At most, only one-third of it may be lost. Women, who are accustomed to the loss of blood, withstand blood loss much better than men. Following hemorrhage, the body must maintain the blood pressure to maintain the circulation. First, certain blood deposits are mobilized. Then, the peripheral blood channels are narrowed and simultaneously the heart rate is accelerated. Only after failure of these regulating processes does the blood pressure fall and the biological potential becomes disordered. The oxygen demand of the tissues can then no longer be satisfied and the removal of carbon dioxide from the tissues becomes inadequate. By a backward diffusion of tissue fluid through the vessel walls as the result of osmotic and oncotic pressure differences the blood becomes diluted. The organisms becomes converted into an oligocythemia. However, the various portions of the circulation apparently do not take part equally in these changes. It is not conceivable that these equalizing processes are centrally directed. The behavior of the capillaries is apparently regulated automatically by the biological potential. From the suffocating tissues in increasing anoxic anolytic cell toxins may enter the circulation in increasing quantities, as Bacterem Payr and Kier have assumed. This conversion may explain

man's failures of properly performed transfusions. The circulatory failure in collapse, particularly the hæmorrhage into the abdominal vessels, differs from external hæmorrhage.

The author's experiments have shown that infusions of blood serum are less efficacious than the transfusion of fresh blood. The heart seems to depend most upon the degree of filling of the vessels and the respiration depends most on the breathing surface, that is, the erythrocytes. Kallius reported a striking result from the infusion of 700 c cm of donor's blood in hæmorrhagic respiratory failure. In the replacement of lost blood it is necessary not only to maintain the blood pressure but also to sustain the respiration. In very severe hæmorrhages, the transfusion of blood is indispensable for the saving of life at least up to a certain point. When the primary effect has been obtained other fluids such as homologous serum may be employed without hesitation. Obviously, blood transfusion provides the body with valuable building material primarily hæmoglobin and colloids. In addition it stimulates the blood-forming organs and protects tissues by blocking the destructive processes. The administration of hæmoglobin in the form of a dilute solution of blood has proved very valuable. The author uses every blood clot and extracts blood-soaked compresses with salt solution in order to restore every possible drop of blood to the body.

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Other causes are the use of unclean apparatus and of citrated blood, incipient coagulative changes produced in the transfused blood before it enters the circulation by the agitation and whipping incident to its withdrawal, allergic phenomena in the recipient, the production of ill effects on the kidney the cause of which is not understood, overtaxation and overdistention of a diseased heart, and the transmission of disease to the recipient.

HAROLD M. BRILL, M.D.

# SURGICAL TECHNIQUE

## OPERATIVE SURGERY AND TECHNIQUE; POSTOPERATIVE TREATMENT

Pólya, J. *Surgical Operations in Senility (Chirurgische Eingriffe im Senium)* *Therap* 931 viii, 395.

The theory that old persons should not be operated upon unless there is immediate danger to life is a widespread and deeply rooted medical misconception. Pólya disagrees with this view and reports the cases of twenty-seven patients who were operated upon between the ages of seventy-one and eighty-eight years and were cured. The conditions for which operation was done included incarcerated umbilical hernia (radical operation) bilateral incarcerated femoral hernia (radical operation) incarcerated inguinal hernia with gangrene of the spleen (resection of the spleen) incarcerated umbilical hernia (bowel resection) ventral hernia (eighty-eight year-old man) chronic appendicitis (appendectomy) internal incarceration and strangulation of the small bowel by a splenic band appendicitis cholecystitis pyloric stenosis alone or the lesser curvature of the stomach prolapse of the rectum diabetic gangrene of the lower extremity (amputation below the knee) advanced carcinoma of the cheek extensive carcinoma of the vulva carcinoma of the prostate and carcinoma of the cervix (seventy-nine year-old woman). These cases prove that very old persons may survive even the most severe surgical interventions, and that age alone does not constitute a contra-indication to operation.

While the aged organism is without doubt less well suited for surgical treatment than the young organism, it is possible today to operate under more favorable circumstances than existed from twenty to thirty years ago. Chiefly because of the extensive development of local anesthesia, our increased understanding of sepsis, and our corresponding knowledge of after-treatment, senile patients may now be operated upon with greater safety than previously. The two factors chiefly to be feared in the cases of aged patients are anesthesia and lowered resistance to infection. The greatest danger due to these two factors is pneumonia. Old persons not only develop pneumonia much more readily than young persons, but also resist it less well than young persons. Therefore an absolute requisite for operation on old persons is the most complete application of all prophylactic and curative procedures against a possible postoperative pneumonia. While narcotics should be as limited as possible, it cannot always be avoided. It often serves as an adjunct and after the operation itself requires deep anesthesia (internal intestinal obstruction). In exceptional

cases, provided the somatic conditions permit, general anesthesia must be used also for psychic reasons (excitation states, limited intelligence). However, cautiously induced anesthesia is well tolerated by old persons.

As the blood vessels and heart are practically never entirely intact in senility it is not to be expected that cardiac function and vascular innervation will adapt themselves rapidly to the demands of severe infections and laboriousness or massive hemorrhage. Therefore care must be taken to keep senile patients from coming to operation in a serious condition. An intoxication developing, for instance, from severe and advanced flux can be successfully resisted by the younger organism by mobilization of all its forces, but this is less to be expected of the old organism. On the other hand, in beginning flux a completely successful result may be obtained from operation even in senility.

In cases of uncomplicated hernia in young persons operation should always be advised, but in the cases of this condition in old persons operation should be done only if serious symptoms appear. If the hernia is not retained at all or not retained completely by a truss, if the patient does not tolerate a truss, if there are frequent herniations which become reduced spontaneously or can be reduced by taxis, or if pain is caused by coughing or straining.

In the aged, appendicitis is not very common, but it sometimes occurs in a very severe form. In such cases operation is indicated definitely. The principle of early operation, which is the rule in the cases of young persons, is not always to be followed in the cases of old persons, especially when the condition is mild or shows a tendency to improve. In definite, severe, or rapidly progressing cases pre-contraindication is no more permissible in the cases of old persons than in those of young persons.

The prognosis of flux in the aged is comparatively poor especially when the condition is complicated by perforation or severe intoxication which, in the senile body, are poorly resisted. Even in such cases a successful result may be obtained by operation performed at the right time.

Gallstones occur frequently in old age and make operation absolutely essential because of their severe manifestations and complications.

Gastric ulcers and their sequelae are most common in the young, but occasionally occur also in the aged and may be operated upon successfully in old persons.

Hemorrhoids frequently cause marked discomfort in the aged, the masses often enlarging because of impairment of the circulatory conditions. As a result of weakness of the sphincter larger masses

readily prolapse, and it is particularly the complaints associated with prolapse which bring the patient to the surgeon for treatment. Excision is usually well tolerated so that even the very radical Whitehead operation may be done under local anaesthesia.

Removal of the hypertrophied prostate gland especially by the transvesical operation, is well tolerated by old persons.

Amputations for senile gangrene performed under local anaesthesia are also well tolerated by aged persons provided there are no severe disturbances of the circulation and provided the operation is not delayed until septic manifestations have supervened.

A frequently recurring problem is the treatment of senile cancer. In the aged carcinoma is frequent but is relatively benign. Because of the latter fact operation is often regarded erroneously as unnecessary and X-ray or radium treatment is used. However, it must be borne in mind that benign carcinomata are less sensitive to the X-rays and radium and that, because of their benign character, they are not apt to recur after surgical removal. Moreover, it means much to the patient to be freed of the cancer. The prognosis of surgical treatment of skin cancer, which is so frequent in the aged is excellent.

Operation for internal cancer constitutes a special problem but even in this condition a good result may be hoped for from a radical procedure. In the absence of special contra-indications to surgical intervention, such as severe cardiac or renal insufficiency, an operable carcinoma should be operated upon even in the cases of patients who are very old.

EMMERICH ILLES (Z)

Overholt, R. H., and Veal, J. R. Difficulties in the Differentiation of Postoperative Pulmonary Complications. *Surg Clin North Am*, 1932, vii, 655.

The authors present case reports showing the difficulties in the differentiation of postoperative pulmonary complications. The greatest difficulties are encountered in the differentiation of atelectasis and pneumonia, either bronchial or lobular, especially when the latter develops after the former. If atelectasis is present it will be in proportion to the hypoventilation of the lung tissue and will clear up in direct proportion to the re-establishment of pulmonary ventilation.

Other pulmonary complications are more easily diagnosed. Unilateral massive collapse with shifting of the surrounding structures to compensate for the decrease in lobe volume, pulmonary infarction and bronchitis are usually easily detected. Pleurisy, lung abscess, and pulmonary oedema also present more definite findings which can be readily differentiated. The diagnosis is dependent upon evaluation of the symptoms, physical findings and roentgenographical changes in relation to the time of their onset and their duration.

MANUEL E. LICHTENSTEIN, M.D.

Brown, A. L., and Debenham, M. W. Postoperative Pulmonary Complications. A Study of Their Relative Incidence Following Inhalation Anaesthesia and Spinal Anaesthesia. *J Am M Ass*, 1932, xcix, 209.

In the cases of 812 patients subjected to operation, the authors found that pulmonary complications were about 5 times more frequent after subarachnoid anaesthesia than after inhalation anaesthesia. This was true regardless of the type of operation. The more closely the operative procedure approached the diaphragm the higher became the incidence of pulmonary complications.

The authors attribute the greater incidence of pulmonary complications after spinal anaesthesia to decreased depth and force of the respiratory movements, increased viscosity of the secretions of the tracheobronchial tree, a longer period of quietness after the operation, and the greater length of time required for operation under spinal anaesthesia.

GEORGE R. McAVULIFF, M.D.

Bancroft, F. W., and Stanley-Brown, M. Postoperative Thrombosis, Thrombophlebitis, and Embolism. *Surg, Gynec & Obst*, 1932, liv, 898.

From a study of postoperative thrombosis, thrombophlebitis, and embolism over a period of four years, the authors draw the following conclusions:

1. Loose abdominal dressings, early postoperative feeding, and the administration of fluid relieve postoperative distention and distress and may diminish the incidence of thrombosis.

2. Blood studies show that certain persons are more prone to develop thrombosis than others. The blood abnormalities can frequently be improved by diet and intravenous medication.

3. Operative and postoperative trauma and infection probably liberate substances in the blood which tend to change normal into abnormal clotting factors. Routine blood studies frequently show changes in the clotting factors before the onset of thrombosis and thrombophlebitis. In some cases thrombosis and embolism may be aborted by giving a diet low in fats and proteins and administering sodium thiosulphate intravenously.

4. While it is not certain that the administration of sodium thiosulphate is the best method of solving the problem, it seems to be a definite aid.

EMIL C. ROBITSHEK, M.D.

Garbien, A. Early Postoperative Herniae (Fruehe postoperative Evertationen). *Ginek polska*, 1931, x, 731.

After reviewing the history, classification, etiology, prevention, symptoms, course, prognosis, and treatment of postoperative herniae, the author discusses his own statistics and the results of treatment.

Of 1,123 cases in which a laparotomy was performed in the Obstetrical and Gynecological Section of the General Hospital of Lemberg in a period of three years, a postoperative hernia occurred in 23 (2

per cent). Fifteen of the women with postoperative hernia died, the mortality of the condition being therefore 65 per cent.

The author divides the cases of postoperative hernia into 3 groups. In the first group he places 7 cases of mechanical hernia, which constituted 0.62 per cent of the total number of postoperative hernia. The predisposing factor in this complication was careless suturing of the rectus sheath, and the immediate causative factor was an increase in the intra-abdominal pressure from coughing or vomiting. The prognosis was favorable, the mortality being only 14.3 per cent (1 death). The treatment consisted of freshening of the wound edges and immediate secondary suture.

In the second group the author places 7 cases of anasthetic hernia, the cause of which was a disturbance of nutrition from cachexia, marked anemia, or diabetes mellitus. The prognosis was poor as the mortality was 85.3 per cent (5 deaths). The treatment consisted in improvement of the nutrition and secondary suture.

In the third group Garbieri places 10 cases of suppurative hernia due to infection of the laparotomy wound. In these cases the prognosis was very poor, the mortality being 90 per cent (9 deaths). The treatment was conservative.

The direct causes of the mechanical hernia were diffuse bronchitis in 5 (71.4 per cent) of the cases, spreading pneumonia in 1 (14.3 per cent) and active pulmonary tuberculosis in 1 (14.3 per cent). The direct causes of the anasthetic hernia were cachectic cachexia in 3 (42.9 per cent) of the cases, sarcomatous cachexia in 1 (14.3 per cent), diabetes mellitus in 1 (14.3 per cent), and posthemorrhagic anasthesia in 1 (14.3 per cent). The direct causes of the suppurative hernia were primary suppurative of the fascia of the recti muscles in 5 (50 per cent) of the cases, and secondary suppurative of the fascia of the recti muscles in 5.

The postoperative hernia may be divided according to the surgical procedure as follows:

Of 368 cases of hysterectomy by the method of Freund, a mechanical hernia developed in 3 (0.81 per cent), an anasthetic hernia in 4 (1.08 per cent) and a suppurative hernia in 6 (1.63 per cent). Altogether there were 13 hernia after this operation, the incidence of the complication being therefore 3.52 per cent. Of 53 hysterectomies by the method of Wertheim, a suppurative hernia occurred after 3 (5.7 per cent). Of 44 hysterectomies by Freund's method for carcinoma of the portio, a hernia followed 5 (11.4 per cent). One of the hernia was anasthetic and 1 was suppurative. Of 24 supravaginal amputations of the uterus, a mechanical hernia developed after 3 (12.5 per cent). Of 263 cases in which the adnexa were removed, a mechanical hernia developed in 1 (0.38 per cent) and an anasthetic hernia in 1 (0.38 per cent). The total incidence of hernia in this group was therefore 1.14 per cent (3 hernia). Of 94 cases of cesarean section, a suppurative hernia developed in 1 (1 per cent).

With regard to the relation of postoperative hernia to disease, the statistics show that of 97 cases of carcinoma of the portio an anasthetic hernia developed in 1 (1 per cent) and a suppurative hernia in 3 (3 per cent). And of 14 cases of carcinoma of the body of the uterus, an anasthetic hernia developed in 1 (7.1 per cent). Of 265 cases of uterine myoma, 1 mechanical hernia developed in 1 (0.38 per cent) in anasthetic hernia in 1 (0.38 per cent), and a suppurative hernia in 3 (1.13 per cent). The total incidence of hernia in this group was therefore 1.60 per cent (6 hernia). Of 6 cases of sarcoma of the uterus, 1 mechanical hernia developed in 1 (16.7 per cent), and of 3 cases of sarcoma of the ovary, an anasthetic hernia occurred in 1 (33.3 per cent). Of 114 cases of ectopic pregnancy, an anasthetic hernia occurred in 1 (0.88 per cent). Of 126 cases of cystic tumor and papillary cystadenoma of the ovary a mechanical hernia occurred in 1 (0.79 per cent). Of 93 cases of non-suppurative inflammations of the adnexa, 1 mechanical hernia occurred in 1 (1 per cent) and of 98 cases of suppurative inflammations of the adnexa, a suppurative hernia occurred in 1 (1 per cent).

The author is of the opinion that a classification of postoperative hernia into mechanical, anasthetic, and suppurative is necessary because in each of these groups the symptoms, prognosis, and mortality are different and different treatment is required.

Dr. von Sotomayor (Q)

#### ANTISEPTIC SURGERY; TREATMENT OF WOUNDS AND INFECTIONS

Bird, C. E., and MacKay E. M.: The Healing of Wounds; An Experimental Study to Show the Influence of Body Dehydration. *Surg., Gynec. & Obst.*, 1927, 47: 872.

The authors state that for an understanding of wound healing it is necessary to consider: (1) the factors which control the initiation of the process, (2) the factors which control subsequent growth, and (3) the factors which bring about cessation of healing.

In experiments on rats Bird and MacKay followed in general the method described by Harvey and Howe. The body weights and the food and fluid intake of the animals were recorded daily. All of the animals were kept on a slightly modified Osborne and Mendel diet. Under ether anesthesia a transverse incision 1.5 cm. long was made in the pyloric antrum on the anterior wall of the stomach. This was immediately sutured in two layers with catgut No. 000 plain cutgut by a suture technique. Precautions for asepsis were found unnecessary and there was never any evidence of peritoneal inflammation or infection of the abdominal wounds. From four to fourteen days after the operation the strength of the wound in the gastric wall or, if the wound proved the more resistant, of the gastric wall itself was estimated by the following procedure.

The rats were killed with ether and their stomachs opened immediately and kept moist with physiological sodium chloride solution. The cropplage

orifice was tied off securely and a suitable cannula introduced into the stomach through the pylorus and tied in place. The stomach was then distended with air until it burst, and the pressure at the instant of bursting was recorded in millimeters of mercury.

The experiments show that, in rats, moderate dehydration comparable to states of dehydration observed clinically result in striking weakness in gastric wounds and elsewhere in the walls of the stomach than in the region of the wounds. These effects are marked up to at least fourteen days after operation, the limit of time to which the experiments were continued.

It is suggested that dehydration has a decided inhibitory effect on the processes of repair in general, and that even after as short a period as four days causes sufficient destruction of body protoplasm to weaken many tissues considerably, whether or not they have been operated upon.

These findings emphasize the importance of an adequate supply of fluid in all cases of injury. It must be borne in mind, however, that dehydration can neither be prevented nor cured by water alone. Sodium chloride must be supplied in addition.

EMIL C. ROBITSHEK, M.D.

Lucchesi, P. F. The Serum Treatment of Nineteen Cases of Anthrax, Including One of External, Internal, and Bacteraemic Type. *Am J M Sc*, 1932, *CXXXII*, 795

Anthrax is a not infrequent condition among workers in the wool and leather industries. No other industrial disease has such an insidious onset and such devastating results. It may be fatal in twenty-four hours. The mortality is 10 per cent in the external type of the condition, 90 per cent in the internal type, and 100 per cent in cases with blood-stream infection. In the nineteen cases reported by the author there were no deaths.

The disease is prevalent among animals and contracted by man through the handling of infected materials, either directly or indirectly. Most of the infections in man can be traced to foreign hides. Infection has occurred from the use of shaving brushes and through foot wounds and from the soil. As person-to-person infection is rare, it should be possible to treat cases in a general hospital.

Anthrax is external or internal in type. The pulmonary form results from the inhalation of dust impregnated with anthrax bacilli. It usually occurs in wool sorters. The intestinal form follows the ingestion of bacilli or the highly resistant spores, which probably gain entrance to the mouth from contaminated hands. The external type of anthrax, which is the most frequent, is also of two forms—the solitary lesion, called "malignant pustule," and the diffuse or "malignant oedema" form. The most common sites of the external type are the face, neck, forearms, and arms. All of the author's cases were of the external type, but in one case of malignant oedema the pulmonary type with bacteraemia was also present.

The author describes the symptoms of the various types. The pulmonary type is characterized by pain in the chest, cough, bloody sputum, and cyanosis, and the intestinal type by abdominal pain, nausea, vomiting, and diarrhoea.

In the treatment of the disease numerous corrosives and antiseptics have been used and even cauterization and excision of the pustule have been tried. Excision was done in one of the cases reported by the author, but was followed by extensive spread of the oedema. Mercury succinimide was tried in conjunction with anti-anthrax serum, but was abandoned in favor of the use of the serum alone.

The serum is given in one large dose, repeated after twenty-four hours if necessary, rather than in smaller doses at intervals of eight hours. The lesion is cleansed with saline solution and a culture and smears are taken, the scab being elevated or a small vesicle ruptured if necessary. Blood is taken for culture and warm anti-anthrax serum allowed to run in slowly through the same needle. As a rule 150 c.c.m. of serum are used, but the dose varies from 100 to 250 c.c.m. If the location of the lesions permits, a total of from 30 to 50 c.c.m. of serum is injected well outside of the lesion through four points in a circle. The oedema shows an increase for twenty-four hours, but begins to decrease in forty-eight hours. At the end of seven days only the black eschar remains.

Serum reactions accompanied by chills were noted in four of the author's cases, but were easily controlled by hot drinks, external heat, and adrenalin. The case of both external and internal anthrax with blood-stream infection is reported in detail.

In a review of the literature the author cites Krouse's report on 200 cases treated with normal beef serum with 1 death. Ruiz has obtained good results from the use of bacteriophage. Pypier reported 40 cases treated with 2 or 3 injections of 0.9 gm. of neo-arsphenamine with no deaths.

E. S. PLATT, M.D.

Unger, E. The Treatment of Gas Gangrene with Serum (Behandlung des Gasbrandes mit Serum). *Zentralbl f Chir*, 1932, p. 1006

In the year 1917 reports were made from numerous sources regarding the use of a polyvalent gas-oedema serum. In 1931, attention was again drawn to the problem of the treatment of gas oedema by Loehr, Zeissler, and Schlossberger who reported investigations carried out with two sera, one a polyvalent gas-oedema serum which neutralizes the toxin of the gas-gangrene bacillus, and the other an anaerobic serum which contains tetanus antitoxin.

In animals, the polyvalent serum prevents gas gangrene as surely as tetanus antitoxin prevents tetanus infection. In clinical cases the evaluation of the serum is difficult because the clinical picture associated with a positive anaerobic culture may vary considerably, and because the virulence test in experiments on animals is no index of the patho-



genic action of the organism in man. The author believes that in two of six cases of gas gangrene of the head and body the serum had a favorable effect upon the course of the disease. In thirteen cases of gas gangrene of the extremities he gained the impression that injection of the serum into the arm or leg proximal to the site of the lesion prevented the spread of the infection. Amputations could still be done safely in the upper course of the gas phlegmon. In the cases of two children with severe injuries of the lower extremities who were given prophylactic injections of the serum the development of gas gangrene was not prevented, but the spread of the condition was checked by several more injections and several small incisions over bulging areas. One patient died from anaphylactic shock, and it is probable that anaphylactic disturbances were a factor also in the death of another.

The author draws the following conclusions:

1. The wounds should first be treated by extensive removal of all destroyed tissue and with drainage, and should be left open.

2. Prophylactic injections of serum should be made around all wounds in which gas-bacteria infection is possible, especially automobile injuries. Preferably an anaerobic serum should be used, but if tetanus antitoxin has been administered previously only gas-gangrene serum should be employed.

3. In definite cases of gas gangrene serum effused with a large quantity of salt solution to which adrenalin

has been added should be injected slowly proximal to the wound. As a rule the injection should be given intravenously but in some cases intra-arterial injection is indicated.

4. In order to prevent anaphylactic shock the main dose of serum should be given under anesthesia and with great care. Several hours previously a small dose should be given for desensitization.

A. BERNARD (2)

## ANESTHESIA

Nagata, G.: The Alkali Reserve and Acidosis (*Reserve alkaline et acidose*). *Clin. chir. exp.*, viii, 252.

After a brief general discussion of postoperative acidosis and a consideration of the many factors which may be involved in this condition the author presents the results of his investigations regarding the relative value of ethylene and other anesthetics in the prevention of acidosis. After the operation nothing that might disturb the alkali reserve was administered to the patient. When hypodermoclysis was necessary only physiological saline solution was given. Specimens of blood used to determine the carbon-dioxide combining power as an index of acidosis were taken just before immediately after and seven, twenty-four and sometimes forty hours after the operation. It was found that the acidosis was much less marked after ethylene than after ether anesthesia.

A. LOOMIS, M.D.

# PHYSICOCHEMICAL METHODS IN SURGERY

## ROENTGENOLOGY

Duval, P., and Bécère, H. Insufflation of the Stomach in Clinical Roentgenology, Pneumogastroenterography (L'insufflation de l'estomac en radiologie clinique, pneumogastrographie) *Presse méd*, Par, 1932, xl, 981

The authors state that pneumogastroenterography is of great value in cases of vegetating gastric cancer, gastric polyps and other intragastric tumors. In cases of cancer it not only shows the mass clearly in the gastric cavity but also reveals its base and point of implantation in the gastric wall information which is of importance in determining the operability of the condition. In cases of polyposis it shows the individual polyps and the size of the individual pedicles. In cases of single gastric polyps it permits an accurate estimation of the size and point of implantation of the pedicle.

Insufflation has been employed by some also in cases of gastric ulcer, but the authors advise against its use in this condition as it yields no more information than the opaque meal and is associated with the danger of rupture of the eroded gastric wall from the increased intragastric pressure.

In the technique of insufflation used by the authors an Einhorn tube is passed and when the X-ray shows that this has entered the ampulla of the stomach air is insufflated by a Dieulafoy pump. If pain results the air is at once aspirated and the examination discontinued. Effervescent powders are not employed because the gas tension cannot be controlled.

After the insufflation of the air roentgenograms are made with the patient in the standing position to demonstrate the large gastric cul-de-sac, in the prone position to obtain a view of the middle portion of the stomach and in the prone position with the head lowered and the feet elevated on a tilting table in order to fill and obtain a view of the pylorus and duodenum.

In conclusion the authors state that this procedure is only complementary to other roentgenographic studies.

JAMES B. MASON, M.D.

Kahlmeter, G. Modern Physiotherapeutic Measures *Proc Roy Soc Med*, Lond, 1932, xxv, 1117

The author discusses all of the modern physiotherapeutic measures, but devotes most of his article to roentgen-ray treatment and gives the impression that this is the method he prefers.

He believes that in chronic arthritis massage is of value chiefly to get rid of exudates. He states that even in acute cases of arthritis active and passive movements are very important. He believes that baths are of benefit chiefly because of the movement

of the joints in the water. Except in cases of osteoarthritis diathermy has not proved of value. Frequently it increases the pain.

Kahlmeter has found fractional courses of X-ray irradiation beneficial in all forms of arthritis. He advocates 1/6 of a skin-erythema dose every two or three days until 50 per cent of an erythema dose has been given. The kilovoltage and filter depend upon the depth and size of the joint.

Good results were obtained with this treatment in 60 per cent of 180 cases of rheumatoid arthritis, 90 per cent of 15 cases of gonorrheal arthritis and 60 per cent of 10 cases of gout. In osteoarthritis and spondylosis rhizomelica the results were less satisfactory, a good result being obtained in only 40 per cent of 41 cases of the former condition and no improvement in the 6 cases of the latter condition which were treated.

Of 122 patients with peritendinitis, 90 per cent recovered, 8 per cent were benefited, and 2 per cent were not benefited. A good result was obtained in 65 per cent of 34 cases of lumbago, 60 per cent of 65 cases of sciatica and 80 per cent of 54 cases of brachial neuralgia.

The results reported were immediate results. It is not certain that X-ray treatment will protect against recurrences. However, it has the advantages of being simple, speedy, and inexpensive.

CHARLES H. HEACOCK, M.D.

Holthusen, H. Radiotherapy in Otorhinolaryngology (Strahlentherapie in der Oto-Rhino-Laryngologie) *Ztschr f Hals-, Nasen-, u Ohrenheilk*, 1932, xxx, 3

Holthusen presented a very thorough review of radiotherapy in diseases of the ear, nose, and throat at the meeting of the Society of German Otorhinolaryngologists at Ems in 1932. He discussed briefly the history of the development of treatment with roentgen and radium rays—the intensive treatment with the roentgen rays since 1910 and the technique of treatment with radium and mesothorium since 1910 and 1912. He called attention to the increase in our knowledge of the manner in which the rays produce their effects and showed how the discovery of the greater effectiveness of radium led to a change in roentgen treatment with prolongation of the irradiation time and simultaneous compensation for the scattered fractioning by a marked increase in the total dose, the so-called "protracted irradiation." With this change more attention was paid to the wide differences in the radiosensitivity of tumors. The aim now is to administer a definite dose—the smallest dose that will destroy the tumor—to the entire area involved by the neoplasm. The attainment of this aim depends, not on the capacity of the

apparatus, but on the tolerance of the tissue surrounding the tumor. We are now becoming able to prognosticate the radiosensitivity of a tumor from its histological character. However for the general prognosis, the extent of the tumor, the extent of regional metastasis or dissemination in the organism as a whole which is present or to be expected, and the nature of the parent tissue are also of importance. Carcinomata of the mucous membrane of the upper respiratory tract which are formed from the more highly differentiated peckle cells are less radio-sensitive than those arising from the immature basal mucous membrane layers. Of fundamental importance is the change in the time factor in protracted and fractional roentgen irradiation according to the method of Regaud and Contant with large total doses (in addition to increased voltage and hard filtration). For this method Halthren proposes the term protracted irradiation to differentiate it from the earlier short irradiation. Radium rays and roentgen rays are equal in value, basically but radium is rendered more effective by the time conditions of its use and the greater possibility of concentrating its rays in space.

Halthren next discusses the possibilities of general methods of roentgen and radium treatment according to the variations in the site, extent, and accessibility of tumors of the upper respiratory tract and the ear. It has proved of practical value to divide the cases into 3 groups: (1) cases in which no lymph glands are demonstrable by palpation; (2) cases with palpable but easily removable lymph glands that have not yet broken through their capsules; and (3) cases with bilateral lymph-node metastases or lymph glands which are adherent to their surroundings. In deciding on the treatment it is necessary to consider also the radiosensitivity of the tumors as evidenced by their histological structure. It is generally agreed that in cases with palpable lymph-gland metastases operative removal of the glands is indicated. For glands with an already ruptured capsule nothing can be considered but thorough roentgen irradiation or distant radium irradiation. In the use of large total doses the fact that the reactions which regularly occur in the healthy surrounding tissues are of a temporary character is of importance. These reactions are dry exfoliation or weeping dermatitis, inflammation of the epithelium with the formation of a diphtheritic membrane on the mucous membrane, dryness of the mouth, rhinoid formation in the angles of the mouth, the secretion of viscous mucus, dislocation in the sense of taste, transient early edema of the larynx, and disturbance in swallowing.

A table of 185 of the author's cases shows that in more than half of them at least temporary complete freedom from symptoms was obtained. This relief lasted from four months to two years in spite of the fact that the table includes all of the cases, even those that were absent in the terminal stage at the time of treatment. In comparison with the results of the previous mainly surgical treatment, the

results of irradiation are still unsatisfactory in tumors of the nose and nasal cavity, of the nasopharynx, and of the mouth with the exception of the tongue. The results are better in cancer of the lip (particularly from the cosmetic standpoint) and are especially good in cancer of the nasal and hypopharynx. They are favorable also in cancer of the larynx. For cancer localized on the vocal cords radium treatment through a window reaction is used, but for all other cases roentgen treatment is preferable.

ALANUS (H).

Mattick, W. L.: Radiation Therapy of Cancer. Basic Principles, Their Application and Results. *Radiology* 1932, April, 1079.

This article begins with a brief review of the action and the more essential physical measurements of the harder roentgen rays and the gamma rays of radium used in the treatment of cancer. The biological action is dependent upon the incident radiation absorbed and the law of Bergonie and Tribondeau that young growing cells undergoing mitosis are more susceptible to radiation than adult cells. The body tissues are arranged according to their radiosensitivity as follows: lymphatic tissue, leucocytes, testicular and ovarian tissue, basal skin cells, mucous membranes, endothelial lining of such, adrenals, liver, kidney, connective tissue, muscle, cartilage and bone.

The systemic effects of radiation mentioned are a decrease in the blood pressure and in the potassium, sodium chloride, cholesterol, and fatty acid content of the blood, and an increase in the alkali reserve, hydrogen-ion concentration, calcium content, plasma volume, total plasma proteins, and the coagulability of the blood.

With regard to dosimetry the author discusses the direct method of measurement with ionization chambers and the indirect method depending on the sphere gap, voltmeter milliammeter and as accurate timepiece measurement in terms of surface reaction or biological erythema and depth dose and the means used to determine effective wave length or quality of the beam employed in roentgen therapy. Attempts at standardization have resulted in quite general adoption of the International unit, the roentgen, designated as  $r$ , and the newer dosimeters are calibrated to register it. The Cleveland Clinic has given the following physical dosage, expressed in  $r$  as corresponding to ed with the biological erythema, or 100 per cent dose, when secondary radiation is eliminated:

Gamma rays  
500 k (U)  
140 k (Al)  
or k (unfiltered)

It yields  
1,500-2,000  
300-400  
100  
500

In actual technique with either the roentgen rays or radium, great care must be taken to use filters which will deliver the ray quality desired. In roentgen therapy 3 mm. of aluminum, from 0.5 to 3 mm. of copper and 1 mm. of lead are used, but for routine

work 0.5 mm of copper is probably most efficient and economical. In the use of radium, a filter which will screen out approximately 99 per cent of the beta rays is generally employed. Attention should be paid to the field size and its relation to the time element for the erythema dose and to the well-known inverse square law affecting the time element in relation to the skin-target distance from the source of radiation.

For a divided dosage technique a comprehensive idea of the principles involved is necessary. Thus, the erythema produced by a single massive dose of 100 per cent at 200 kv with a filter of 0.5 mm of copper, effective 0.6 A, has been found to correspond to that of a dose of 110 per cent over three days, 120 per cent over five days, 130 per cent over eight days, 140 per cent over ten days, and 150 per cent over fifteen days, when treatment is given every second or third day.

The chief methods of radiation used at present are listed as follows:

1 Massive dose technique. Unfiltered, aluminum or copper.

2 Divided dose technique. Aluminum or copper up to 1 mm.

3 Protracted dose technique. Three millimeters of copper or 1 mm of lead. Low milliamperage.

4 Saturation dose technique. Aluminum or copper.

The proper treatment of cancer depends upon early diagnosis and the use of radiation and surgery in various combinations. The author briefly reviews the methods of treating common types of malignancy and the five-year end-results reported from sources with sufficient material to make their statistics of value.

Among the conditions considered are basal-celled epithelioma or rodent ulcer, in which a high percentage of good results has been obtained, squamous-celled epithelioma or epidermoid carcinoma (including lesions of the skin, lip, penis, clitoris, and vulva), and epithelioma of the tongue, floor of the mouth, alveolar process, palate, antrum, pharynx, tonsils, and larynx, in which the results have been less favorable. In the treatment of cancer of the esophagus, stomach, and colon by radiation only palliative results can be expected. Breast cancer is discussed at some length, mainly from the standpoint of radiation combined with surgery. In some cases of rectal cancer, epithelioma of the bladder, and carcinoma of the prostate, favorable results have been obtained from radiation.

In epithelioma of the cervix uteri radiation has accomplished one of its most notable triumphs. Many of the largest clinics have discarded radical hysterectomy in this condition in favor of radiation, which produces as good results with practically no operative mortality. Adenocarcinoma of the fundus uteri has also responded favorably to radiation.

In round-cell carcinoma of the testis, even after the disease has shown evidence of metastasis, spectacular temporary reactions are obtained by radia-

tion. Thymoma responds similarly. Up to the present time the results obtained by the author in primary carcinoma of the bronchi and lungs have been poor, but in metastatic lung involvement good palliative results have sometimes been obtained. Mixed tumors of the parotid react fairly well. In mixed tumors, hypernephroma, and adenocarcinoma of the kidney only palliation is obtained as a rule.

The lymphoblastomata, including Hodgkin's disease, lymphosarcoma, and the leukemias are characterized by a comparatively high degree of radiosensitivity. Although the improvement may be only temporary, it is better than can be achieved by any other method. The author believes that moderate treatment to meet the indications is preferable to intensive radiation.

In some cases of fibrosarcoma satisfactory results have been obtained. In bone sarcoma the results are poor except in sarcomata of the Ewing type, in which marked objective and subjective palliation is obtained. So-called giant-cell tumors of bone have responded generally with a most gratifying and lasting result. In melanosarcoma a good result may be expected in a fair proportion of the cases if the patients are seen early before metastasis has occurred.

In conclusion the author warns against over-treatment. He states that it is generally regarded as best to treat cases with a heavy dose and not to repeat the radiation any more frequently than is absolutely necessary—in the average case not within two or three months. Too frequent repetition may lead to a late tissue reaction three or four months after the last exposure.

ADOLPH HARTUNG, M.D.

Zwerg, H. G. *The Theoretical, Experimental, Clinical, and Economic Bases of Protracted Fractional Roentgen Irradiation of Malignant Tumors* (Die theoretischen, experimentellen, klinischen und wirtschaftlichen Grundlagen der pro-trahiert-fraktionierten Roentgenbestrahlung malignanter Tumoren). *Strahlentherapie*, 1932, xliii, 201.

The author presents a comprehensive report on the experimental, clinical, and economic bases of roentgen irradiation by Coutard's method. Coutard's method consists essentially of a series of roentgen irradiations extending over three or four weeks. The individual doses are greatly reduced, but the total dose is extraordinarily large. Altogether, from 6,000 to 10,000 r, equaling from 10 to 20 skin-erythema doses, are distributed over two or three fields. In the original method the intensity averages from 3 to 4 r per minute, no more than 180 r are applied at each sitting, and the size of the field does not exceed 150 sq. cm.

The author studied the difference between simple fractioning without protraction and fractioning with protraction. In the first method 180 r are given in about six minutes, and in the second method 180 r are given in about sixty minutes. In the first series of experiments the differences in the skin reactions

apparatus but as the tolerance of the tissue surrounding the tumor. We are now becoming able to prognosticate the radiosensitiveness of a tumor from its histological character. However for the general prognosis, the extent of the tumor, the extent of regional metastasis or dissemination in the organism as a whole which is present or to be expected, and the nature of the parent tissue are also of importance. Carcinomata of the mucous membrane of the upper respiratory tract which are formed from the more highly differentiated prickle cells are less radiosensitive than those arising from the immature basal mucous membrane layers. Of fundamental importance is the change in the time factor in protracted and fractional roentgen irradiation according to the method of Regaud and Coester with large total doses (in addition to increased voltage and hard filtration). For this method Holtzhausen proposes the term protracted irradiation to differentiate it from the earlier short irradiation. Radium rays and roentgen rays are equal in value basically but radium is rendered more effective by the time conditions of its use and the greater possibility of concentrating its rays in space.

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results of irradiation are still unsatisfactory in tumors of the nose and nasal sinuses, of the nasopharynx, and of the mouth with the exception of the tongue. The results are better in cancer of the lip (particularly from the cosmetic standpoint) and are especially good in cancer of the tonsil and larynx. They are favorable also in cancer of the larynx. For cancer localized on the vocal cords radium treatment through a window reaction is used, but for all other cases roentgen treatment is preferable.

ALANSON (5).

Marrick, W. L.: Radiation Therapy of Cancer. Basic Principles, Their Application and Results. *Radiology* 1932, xviii, 1070.

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The systematic effects of radiation mentioned are a decrease in the blood pressure and in the potassium sodium chloride, cholesterol, and fatty acid content of the blood, and an increase in the alkali reserve, hydrogen-ion concentration, calcium content, plasma volume, total plasma proteins, and the coagulability of the blood.

With regard to dosimetry the author discusses the direct method of measurement with ionization chambers and the indirect method depending on the sphere gap, voltmeter milliammeter and as accurate thermopile measurement in terms of surface reaction or biological erythema and depth dose and the means used to determine effective area lengths or quality of the beam employed in roentgen therapy. Attempts at standardization have resulted in quite general adoption of the international unit, the roentgen, designated as "r," and the newer dosimeters are calibrated to register it. The Cleveland Clinic has given the following physical dose, expressed in r as corresponding well with the biological erythema or 100 per cent dose, when secondary radiation is eliminated:

Gamma rays  
200 kv (Ca)  
40 kv (Al)  
50 kv (unfiltered)

R units  
1,000—2,000  
500—1,000  
100  
50

In actual technique with either the roentgen rays or radium, great care must be taken to use filters which will deliver the ray quality desired. In roentgen therapy 3 mm. of aluminum, from 0.5 to 3 mm. of copper and 1 mm. of lead are used, but for radium

## MISCELLANEOUS

### CLINICAL ENTITIES—GENERAL PHYSIOLOGICAL CONDITIONS

Schilling, V. The Biological Leucocyte Curve as an Indicator of the Course of Disease and Its Practical Application (Die biologische Leukocytenkurve als Spiegel des Krankheitsablaufs und ihre praktische Verwendung) *Med. Klin.*, 1932, 1, 283, 319

The character of a hæmogram depends fundamentally, not on the type of the infecting organism, but on the general laws of infectious or toxic injury of the body. In agreement with his theory that, in addition to the myeloid neutrophile system, there is a monocytic reticulo-endothelial system and a lymphocytic system the author is able as the result of years of observation and investigation, to distinguish by systematic blood studies three definite time intervals in the course of infections.

At the beginning of every infection there is the neutrophilic resistance which is manifested less by an absolute increase in the number of leucocytes than by a nuclear shift. After this first period of active defense there is a monocytic intermediate phase as the manifestation of the development of immunity by the body, and finally there is a long lymphatic phase which is characteristic of the healing process and is frequently accompanied by an increase in the eosinophiles. These various reactions are shown by curves from a septic process and a malarial infection. Schilling's pupil, Barner, independently of Detre and Hoff, demonstrated a relationship between the neutrophilic response and the nuclear shift in diabetic coma with acidosis. He believes that it is less the acidification alone than the combined effect of the acidosis and alkalosis on the protein catabolism that constitutes the chemotactic principle. Protein destruction is common to infections and toxic processes. Parenteral injection of protein has the same effect. In support of these theories the author cites obstetrical, gynecological, surgical, and medical cases and particularly such conditions as pregnancy, labor, operation, and narcosis. The long-recognized stages in the course of disease, such as the rise to the climax, the crisis, and the recovery, are evident in the hæmogram. The neutrophilic phase assists pus formation, the monocytic reaction stimulates macrophagocytosis in the sense of Metchnikoff, and the lymphocytic reaction stimulates the lymphocytic invasion in chronic and healing processes. Therefore the biological leucocyte curve is a picture of the inflammatory reaction taking place in the entire organism, an enlarged projection of the local process by which the body, with the aid of the hæmatopoietic organs, protects itself against foreign toxins.

K. HEIM (G)

Wertheimer, P. Records and a Discussion of Surgical Œdema of the Extremities (Documents et réflexions sur les œdèmes chirurgicaux des membres) *J. de chir.*, 1932, xxxix, 650

Wertheimer reports six cases of surgical œdema. The first was a case of congenital elephantiasis of the legs and genitals of unknown cause. Lymphangioplasty with wide excision gave excellent results.

In the second case there was a localized elephantiasis of one arm. The only possible etiological factor seemed to be a violent emotional disturbance. Lymphangioplasty was beneficial but less successful than in the first case. The drainage material was poorly tolerated. Sympathectomy and aponeurotic excisions proved useless.

The third case was that of a young girl who suddenly developed a marked œdema of one leg after a slight attack of fever. Pelvic lesions were found. Lymphangioplasty and gynecological interventions proved useless.

In the fourth and fifth cases there was a traumatic œdema of one leg. In the latter, ramisection had a good result.

In the sixth case the œdema followed a slight trauma. Sympathectomy was only temporarily successful. A spina bifida was discovered, but operation for this condition was without effect on the œdema. Aponeurotic excision was also of no avail.

In the past, infection was regarded as a possible cause of a kind of dermatitis or chronic cellulitis blocking the lymph passages or causing an obstructing adenitis or lymph stasis. However, such a cause was not evident in the cases reviewed. Ligation of all of the lymphatics of a limb will not cause œdema. Neither will venous obstruction alone. Calvé concluded from his experiments that the lesions of the venous system producing œdema are parietal, adventitial, and periphlebitic. Clinically, Leriche has shown that resection of an obliterated vein causes the immediate disappearance of œdema, having the effect of a sympathectomy. This leads to the consideration of anatomical or functional changes of the nervous system as a cause of chronic œdema. The theories vary according to whether the irritative or destructive lesion is considered to affect the medullary centers, the peripheral nerves, the roots and nerve trunks, or the sympathetic system. Spina bifida was found in several of Léri's cases as in one of those reported by the author. In one of Léri's cases of spina bifida occulta operation revealed an abnormal disposition of the dural sac and atrophy of the sacral roots corresponding to the limb affected.

The appearance or exaggeration of œdema at the time of puberty and the occurrence of associated thyroid symptoms have directed attention to the endocrine glands. Calvé believes that surgical

after protracted and non-protracted irradiation were studied. In rabbits it was impossible to find, either macroscopically or microscopically any difference which indicated an advantage or disadvantage of either the protracted or the non-protracted method. After doses of 6,500 r there were no changes in the vessels and no noteworthy connective tissue proliferation. Injury did not occur until the dose was raised to 9,600 r and was then slight and apparently reparable. The protraction seemed to play a subordinate rôle in the injury.

In the second series of experiments the effect on the white blood-cell picture was investigated. In both cases a typical curve was obtained. With protraction, the total number of leucocytes showed a slow decrease which continued until the irradiation time was half over and then increased. Without protraction, the decrease was more sudden and the increase somewhat delayed. The behavior of the lymphocyte curve was the decisive factor. The more rapidly the lymphocytes decreased, the more severe was the injury. In the animals that died, the lymphocyte curve remained very low and showed no tendency to rise. These animals belonged to the group that were irradiated without protraction.

When the lung was irradiated, inflammatory thickenings of the septa similar to pneumoniae had been found in many of the cases in which the non-protracted method was used. When the protracted method was employed only a very slight reaction was noted. The author therefore concludes that irradiation by the protracted method is less harmful.

In their effect on the heart muscle no difference was noted between the two methods of irradiation, but in their action on the kidneys a remarkable difference was apparent. Irradiation of the kidneys without protraction caused very marked changes and degeneration of the renal epithelium, a considerable increase in the connective tissue, and destruction of the tubuli contorti, whereas irradiation with protraction produced only such slight changes that the picture could not be regarded as pathological.

The clinical conditions treated were mainly carcinomata of the pharyngeal space, the pharynx, the larynx, the tongue, and the mucous membrane of the cheek. The results were in general good, but the author states that the more frequent cure of deeply situated carcinomata cannot be expected until a much higher percentage of superficially located carcinomata are cured.

RAAS (U).

upper as well as the lower extremities. There is a neurosis of the vascular system. The exact focus of the disease is not known. Roepke refers to the theory of Cassirer that the basic disturbance is to be sought in the efferent vasomotor tract as a whole, and that the centers may be involved primarily. However, functional vascular disturbances apparently occur also in juvenile gangrene.

In the etiology, hereditary and familial inferiority of the blood vessels plays a rôle. Of primary importance are racial characteristics. Of the 500 cases reviewed by Buerger, three-fourths were those of Jews. However, this is not surprising as they were seen in a Jewish hospital. It appears that the oriental races are particularly predisposed, but the disease is seen also in Italy, Portugal, and recently, in increasing frequency, in Germany. In Germany it is not the Jews who are most frequently affected.

The condition occurs in men considerably more frequently than in women. Of the 500 cases reviewed by Buerger, only 3 were those of women. It is possible that women are protected from it by menstruation. Toxic influences play a rôle. Alcohol is not a cause, but lead poisoning and the abuse of tobacco are factors. Roepke cites a case in which the condition developed fifteen years after an attack of lead colic. Another cause is increased functional demands such as are imposed by continuous labor with exposure to cold and dampness. Freezing temperatures are of less importance than higher temperatures near the freezing point. The injuries may occur long before the development of the gangrene. Occasionally they are not manifested until after as long as ten years. In Erb's opinion, the gangrene is due to cold injury in 50 per cent of the cases (experiments of von Zöge-Manteuffel). Infectious diseases also play a rôle in its origin. As an example, Roepke cites luetic endarteritis and its sequelæ. On the basis of the theory that hyperadrenalinæmia is responsible, extirpation of an adrenal has been recommended as treatment. Finally, metabolic disturbances may lead to gangrene. Diabetic gangrene is probably due essentially to toxic influences ( $\beta$ -oxybutyric acid). Therefore it is not dependent upon the severity of the diabetes. However, the end-results are the same in diabetic, juvenile, and arteriosclerotic gangrene. Even though in general the primary development of a thrombus is denied, the secondary formation of a thrombus may be an important factor in the onset of the gangrene. The causative factor is to be sought in a disturbance of the neurovascular harmony. This causes circulatory disturbances which produce secondary tissue disturbances. Stasis then results. Finally, slight injuries such as the pressure of the shoes, the ingrowing of a toe-nail, and minor traumata are sufficient to induce gangrene.

In the treatment the attempt must be made to eliminate all injurious influences and to stimulate the development of a collateral circulation. Warm baths, particularly contrast baths, are beneficial as they improve the distribution of the circulation. Above all, it is important to determine whether any-

thing may yet be expected from conservative treatment. For this purpose, determinations of the temperature of the involved extremities, the Moscowitz method of inducing hyperæmia after ischæmia, and arteriography with the use of a contrast medium (uroselectan and abrodil) are of value. In conservative treatment the basic disease must be considered first. Therefore anti-luetic treatment should be given in syphilis, and cardiac medication in cases of heart disease. In addition to contrast baths, exercise therapy and diathermy are to be considered. The administration of the circulatory hormone of Haberland and Frey (padutin) is indicated chiefly in the prodromal stage. Its efficacy has been variously judged. In the opinion of Kappis, it acts only as a non-specific irritant.

Of the conservative operative measures, periaxial sympathectomy has proved very disappointing. The reported successes are to be regarded with skepticism. When an effect is obtained by this procedure it is usually transitory and is followed by aggravation of the condition which demands amputation. Better results are obtained by resection of the lumbar sympathetic trunk and its roots. This is accomplished more easily through an extraperitoneal incision than through a median transabdominal incision. Laewen obtained good results by freezing the sciatic nerve through an oblique incision. This was followed immediately by cessation of the pain. Alcohol injections are also recommended. In cases of local vascular disease the affected segment may be resected. In embolism, embolectomy comes up for consideration as in a number of cases it has saved life. Emboli have been removed successfully even from the aorta. However, embolectomy will always be an emergency operation. The arteriovenous anastomosis of Wiating and extirpation of an adrenal have not been found of value. Therefore, of the conservative operations, only lumbar sympathectomy merits consideration. If gangrene has developed, there is often no alternative to amputation, but with newer methods of study the level of amputation can be determined with much greater certainty than heretofore. Amputations which formerly were done because of pain may now frequently be avoided by nerve operations.

Ceelen cited the first literary reference to gangrene (Philoctetes) by Sophocles, and the representation of pain in the group of the Laocoön. He stated that it is our duty to prevent the development of gangrene if possible and to alleviate the pain. Pathologico-anatomically defined, gangrene is a special form of necrosis, a tissue death in the presence of air. It occurs in 2 forms, a dry gangrene or mummification, and a wet gangrene, which is usually associated with infection. It is caused by injury to the tissue elements themselves or by obstruction of the circulation with consequent loss of nutrition. Injury to the tissues may result from mechanical, thermal toxic, or dyscrasic influences. Obstruction of the circulation may occur from division or compression of the blood vessels, embolism, angiosclero-



edema of the extremities is not due to stasis, toxins, or nervous reactions, but is the result of a local vasomotor disturbance having as its principle cause a vasodilatation i.e. an excessive afflux of blood to the capillaries.

While it is possible that, simultaneously or later, the vasoconstriction of the veins and lymphatics presents an obstruction to the lymph this is merely accessory. The edema appearing after violent emotional disturbances may be due to an abrupt disturbance of vasomotor equilibrium. Surgical edema of the limbs may therefore be due to a disturbance of equilibrium in the vasomotor innervation caused by irritation of the perivascular sympathetic, trauma, or emotion, the purely functional lesion, by its persistence, resulting in anatomical lesions—edematous infiltration of the cellular tissue and sclerosis. Traumatic edema, spontaneous edema, elephantiasis, familial and hereditary trophedema may have some factor in common, but it would be difficult to believe that they are of the same origin or nature.

Operations on the spine seem to have no beneficial effect. In traumatic edema, sympathectomy is of definite benefit especially when it is performed early. In later cases the benefit from this procedure is only temporary probably because the lesions are too old to be affected by changing the vasomotor conditions of the limb. In such cases it is necessary to resort to orthopedic measures, such as Kossel's amputation and Handley's lymphangioplasty, to establish new pathways for the circulation of the lymph.

Kossel & Moore

Bernard, R., and Stassen, H.: Tuberculosis and Traumatism (Tuberculous Traumatism). *Brasileira med.* 93, 211, 243.

The authors report the case of a man forty years of age who had pleurisy while he was in the army in 1915. A year later he was gassed. After the pleurisy he had attacks of coughing. On April 9, 1917 he was struck on the crest of the right ilium by a stone which fell from a height of about a meter. The wound almost healed, but an ulcer developed on the site of the scar and was found to be tuberculous. At this time also an old healed tuberculous lesion was found in the apex of the right lung. The skin reaction to tuberculin was moderately positive. Inoculation of tissue from the ulcer into guinea pigs was negative. The serum reaction for syphilis was negative, but this fact may have been explained by specific treatment given two months before the patient consulted the authors. This treatment was reported to have caused improvement in the ulcer but when it was repeated by the authors it had no effect whatever. A roentgenogram of the iliac bone showed a slight erosion on the lateral region of the crest slightly in front of the anterosuperior spine.

In skin lesions of this kind Koch's bacilli are sometimes numerous, but often are so few that they are not found on microscopic examination. The authors believe that in the case reported the virulence of the

bacilli was reduced. In such cases the tubercles are generally buried in inflammatory tissue and are difficult to find. In about a third of the cases gangrenous inoculation fails. The condition must be differentiated from syphilis, leprosy, sporotrichosis, and actinomycosis.

Alfred Goss M.D.

Koeppke and Coe: Gangrene of the Extremities (Extremitygangrene). *56 Tag. d. Deutsch. Ges. f. Chir.* Berlin, 1933.

Koeppke reminds us that endarteritis obliterans leading to juvenile gangrene was first described in 1878 by von Winiwarter. Von Winiwarter concluded that the disease differs from arteriosclerosis, but other investigators, among them von Zorge-Mantecoff, considered juvenile gangrene to be the result of an arteriosclerosis developing early. Burger who observed numerous cases of juvenile gangrene in the hospital under his direction and reported such a large number that the condition has been given his name ascribed the primary role in the development of the condition to the thrombus and spoke of a thrombo-angitis obliterans. According to Goepel, there is a general disease of the vascular system which involves the veins as well as the arteries. Sternberg believed that the primary factor is the thickening of the muscularis which is due presumably to increased contractions. He called attention to the fact that the findings are the same as those in diabetic gangrene. In the latter condition also an endarteritis obliterans is present.

The gangrene is characterized clinically by prolonged prodromal manifestations of a rheumatic neuralgic nature. The pains and spasms and the dislocations of the skin of the lower extremities appear periodically. To these are added the symptoms of intermittent claudication which also occur at longer or shorter intervals. The intervals between the pains become progressively shorter and the duration of the attacks progressively longer. The pains are aggravated especially during the night and while walking or standing (absence of rest hyperemia). Finally the pulse of the foot arteries can no longer be felt and the temperature of the diseased foot is found to be considerably lower than normal. However even in this stage the process may become arrested. In some cases there may be associated trophic disturbances (eczema, etc.). In any event the disease may continue over a period of years. The described symptoms cannot be explained always and entirely by the anatomical findings in the vessels. The intermittent claudication and the pains are explained by variations in the blood supply by angiospasm, and by an ischemia due to spasm of the vasa vasorum. Such spasmotic states may occur also in the absence of organic disease of the vessels. The author cites the segmental vascular spasm described by Koettner. Vascular spasm alone, if continued long enough, may lead to gangrene. All of these states must be differentiated from Raynaud's disease. In the latter there is usually a symmetrically developing gangrene which may involve the

is due more to the development of a new cell race similar to the formation of new cell races which occurs in the development of the embryo. After the new cell race has been formed it requires no additional permanent stimulation for its growth. The nature of the tumor cell is inherent in its hereditary mass and structure.

There are only two biological processes which are closely related to tumor formation—embryonic developmental processes and regenerative processes in postembryonic life. In both, new types of cells may develop. Just as in the formation of new cell types in the embryo, tumor formation proceeds only during definite and usually very limited periods. The once developed germ continues to grow from within itself. There is no contact infection and no alteration of other body cells coming into contact with the tumor tissue. Just as in the formation of new cell types in the development of the embryo, the organism as a whole exerts an influence (manifested by sensitive periods) on the development of the tumor germ. The author was able to demonstrate this in the so-called irritation tumors. On the basis of a repeated pathological regeneration there developed first a tumor anlage. In mice, general predisposition to tumor formation could be produced by constant tar treatment of various areas of the skin. If then, at any site, a marked regeneration stimulus was produced by a burn, papillomata developed in the first few months in a high percentage of the scars and squamous epithelial carcinomata developed in the later months. The organism tends to form a tumor germ only when it can act as a whole upon the regeneration process in this way. Tumors resulting from irradiation are also formed from a combination of local regeneration and general injury. Time is a factor of great importance. In chronic tar intoxication in the mouse the sensitive period for papilloma formation is between the fourth and tenth months, and that for cancer formation between the tenth and thirteenth months.

The long latent period in the development of tumors of known etiology (roentgen, anilin, and paraffin tumors and the Schneeberger pulmonary cancer) in man is explained in the same way. Only when a general predisposition has been produced by a long-continued slight toxic action does the regeneration process deviate. However, the majority of the tumors in man have their origin in a disturbance of tissue development in embryonic life rather than in a disturbed regeneration process. The tumor anlagen may be associated with a hereditary pathological predisposition of the organism as a whole or may become evident as the result of acquired disturbances of the organism as a whole. Similar conditions may be produced experimentally when, after an injection of embryonal mush, such general changes are brought about with tar, arsenic, indol, or Rous filtrate that tumors develop from the embryonic cells. The very rare tumors in children of the same parents demonstrate the factor of heredity. The decades-long latency of tumor germs formed in

the period of embryonic development may be compared to the behavior of the dental anlagen and the development of the breasts. In mice in which a predisposition is produced by chronic intoxication the incidence of spontaneous tumors is higher than in untreated animals of the same litters.

The general predisposition to tumor is explained by anomalies of metabolism. The cancer cell meets its need for energy chiefly by a fermentative metabolism. The resulting excess of lactic acid may act as a stimulus to growth. This has been suggested by experiments on young rats (Hentschel) and on the uterine musculature (Buengeler and Ehrhard). The cancer cell has the power also to catabolize glucose into lactic acid, but the resulting lactic acid cannot be further oxidized in cancer tissue. The large content of basic amino acids (nuclear substances) in cancer tissue is regarded as a manifestation of a nuclear disease.

In the cases of animals with tumor, characteristic changes may be demonstrated also by determinations of the fermentative and respiratory metabolism of the animal as a whole. In the cases of human beings with cancer it is possible to demonstrate an alkalosis of the blood. In experimental animals an alkalosis caused by feeding may produce a general predisposition to tumor. The combined oxygen-carbon dioxide breathing applied therapeutically by the author acts in the sense of tissue acidosis and increased respiration. TANNENBERG (G)

#### DUCTLESS GLANDS

Zondek, B., and Krohn, H. A Hormone of the Pituitary Gland Middle Lobe Hormone, Intermedin. The Use of the Erythrophore Reaction of Minnows, *Phoxinus laevis*, in the Demonstration of the Hormone (Ein Hormon der Hypophyse Zwischenlappenhormon, Intermedin. Die Erythrophorenreaktion der Elntze, *Phoxinus laevis*, als Testobjekt zum Nachweis des Hormons). *Naturwiss.*, 1932, p. 134.

Although attempts to produce the gestation coloration of minnows (*phoxinus laevis*) by the use of prolactin and folliculin resulted negatively, the authors were able to produce it regularly as a beautiful red shade on the breast and abdomen with pituitary extracts.

This erythrophore expansion is a specific reaction produced exclusively by a constituent of the pituitary gland. Experiments with the most varied substances, including all of the known hormones of other endocrine glands and particularly prolactin, have yielded negative results. The simultaneous darkening of the skin depends upon the dissemination of the melanophores, which can be brought about with many other substances. Even yohimbine and cantharidin do not affect the erythrophores, although they produce a dark discoloration in other fish. The erythrophore reaction must be produced by some other constituent of the pituitary gland since, according to the negative result of the prolactin experiments, it is not produced by the hormone

sis such as occurs in senile and diabetic gangrene, inflammation such as angitis, endarteritis, and thrombo-angitis obliterans and angiospastic states such as the neuropathic form.

Attention is called to the difference in structure of the aorta and the femoral artery. Whereas the media of the aorta consists of only elastic fibers, the media of the femoral artery contains a definite muscular layer. This is because the femoral artery must actively propel the blood further. If the contraction of the femoral artery were to cease, the circulation would be arrested after each cardiac systole because with each contraction of the heart only the amount of blood which leaves the heart would be propelled through the vessels. For an understanding of circulatory conditions a knowledge of vascular innervation is important. A vessel is never supplied by only a single nerve; the entire nervous system has a part in its innervation. The centers are in the medulla oblongata, in the gray matter of the spinal cord, and in the peripheral ganglia. When the central centers are blocked, the next peripheral centers assume their function. In the adventitia of the vessel there is a network of coarse nerves. A finer network lies on the media. It is probable that the latter penetrates the media. Kuettner's observations of segmental vascular spasm indicate that the media possesses a certain degree of autonomy. The sensory nerves are found chiefly at the points of division of the arteries into capillaries. It is the function of the nervous system to increase the blood flow and to regulate the distribution of the blood. The development of a collateral circulation is dependent also upon all other factors. First there must be anastomoses second the anastomoses must be capable of dilatation and third, the cardiac action must be strong enough to force blood into them. The older the person, the less capable he is of developing a collateral circulation. In aortic sclerosis, occlusion of the popliteal artery will almost always result in gangrene although anatomical collateral pathways are present. Because of our upright position, our lower extremities are always subject to a certain degree of stasis which tends to decrease the circulation. In athletes, calcification of the media is observed early in life. It occurs more frequently in the left leg than in the right because the left leg is the working leg of right handed persons. The almost constant contact of the foot with the ground, unsuitable shoes, pressure, dampness and cold, which affect the local circulation, lead to disturbances.

Ceelen describes in detail some of the forms of gangrene mentioned. First he discusses senile and diabetic gangrene. Both of these are the sequelae of a severe vascular disease incorrectly termed "arteriosclerosis," which affects the media but not the intima. Ceelen considers it necessary to differentiate between medial calcification and arteriosclerosis. In the conditions under discussion cartilage formation occurs in the media. There are whole plates of cartilage which are often so arranged that they resemble the trachea of the goose. As the result of these calc-

ifications the blood is propelled along more slowly and conditions favorable for the development of gangrene are produced. Metabolic products are not removed rapidly enough. Finally a thrombus forms, and a slight blow, squeeze, or similar trauma is sufficient to cause gangrene. As a rule a thrombus is found but gangrene may occur without a thrombus. If the conditions are otherwise favorable for its development. The development of senile gangrene is favored by the atrophy of the tissues, and the development of diabetic gangrene by the vulnerability of the tissues. The microscopic picture in these conditions is very similar. In diabetes the calcifications occur as a rule after the disease has been present for from ten to fifteen years. Also after that length of time there are endarteritic changes which cannot be differentiated from those of endarteritis obliterans.

A specific form of gangrene is juvenile gangrene, sometimes incorrectly called "spontaneous gangrene" or "Boerger's disease." A far more correct term would be "Windwarter's disease." While pathologists seldom see the beginning stages of this condition, Ceelen was able to observe the various stages in a study of 25 specimens obtained by amputation at various sites. Ceelen again emphasizes that the thrombus is not the primary exciting factor. He states that as a result of irritation to the adventitia there is a proliferation of the intima, a productive inflammation, which may occlude the lumen of the vessel and to which a thrombus may occasionally be added. There are both erosive forms and productive forms (endarteritis verrucosa or polypoid). The pictures resemble those of endocarditis. The changes are not limited to the large vessels. The muscular and other vessels are also altered. Similar changes are found in both the vascular system and the connective tissue apparatus. We are dealing with a disease of the vascular connective tissue apparatus in the most varied locations. There are changes similar to those characteristic of rheumatism. Therefore Ceelen regards juvenile gangrene as an infectious rheumatic disease. He attributes the frequency of the condition in Russia and Poland to the climate of those countries. Freezing and infection are the chief factors responsible for its development. Ceelen calls attention to the sensitiveness of the diabetic subject to infection, and the similarity of the pathological findings in diabetic and juvenile gangrene. The development of juvenile gangrene is favored in persons with mesenchymal weakness, that is, those with hypoplastic vessels. In some cases effluents are of value. To avoid a mutilating operation early diagnosis and proper treatment are required.

KONIGSBERG (2).

Fletcher Weale, B. The General Predisposition to Tumor Formation and the Metabolism of the Tumor Cell (Die allgemeine Geschwulstbildung und der Stoffwechsel der Geschwulstzelle). *Für die B. h. h. 93* 1 Sup. 564.

The development of the malignant tumor cell is not the immediate result of external irritation. It

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NOTE—THE BOLD FACE FIGURES IN BRACKETS AT THE RIGHT OF A REFERENCE INDICATE THE PAGE OF THIS ISSUE ON WHICH AN ABSTRACT OF THE ARTICLE REFERRED TO MAY BE FOUND

## SURGERY OF THE HEAD AND NECK

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of the anterior lobe of the pituitary gland. Of the two active substances of the posterior lobe, oxytocin and vasopressin, the latter is secreted in the greater amounts. This was demonstrated by the authors' experiments with ornithin, vasopressin, pitocin, and pitressin. However the substance disseminating the melanophores, the presence of which was demonstrated in this way cannot be identical with oxytocin and vasopressin, as the amounts of the different substances contained in the different parts of the pituitary gland vary considerably. As the melanophore reaction in the frog is produced by a large number of other substances and the erythro-phore-chromatophore reaction of minnows is specific, the latter is a suitable test for the pituitary substance which causes expansion of the chromatophores. The smallest amount that is capable of producing the red coloration in three of five minnows within from thirty minutes to four hours after its injection is designated the "phoxurus unit."

The hormone is obtained by extracting in acetic acid small pieces of the gland which have been dried in acetone. It is found also in the tuber cinereum and thalamus and, rarely, in the fluid of the third ventricle. It is demonstrable in all parts of the

pituitary gland. In sixty human pituitary glands the average amount was 7,000 phoxurus units. The smallest amount, 3,000 units, was found in a case of uremia, and the largest amount, 15,000 units, in a case of uremia and pituitary obesity. The quantities found in the different lobes of the pituitary gland in cattle were as follows: anterior lobe, 4,000 units; middle lobe, 600 units; and posterior lobe, 15,000 units. For each gram of substance, the anterior lobe contained 2,375 units; the middle lobe, 80,000 units; and the posterior lobe, 11,904 units. Because of its predominance in the middle lobe, the authors call the hormone "intermedia." The colloid substance of the pituitary gland contains only about 50 per cent, and the pituitary pedicle, from 1 to 10 per cent, as much as the middle lobe. The intermedia isolated on the basis of the test described differs from oxytocin and vasopressin in its behavior toward acid and alkali and its solubility in organic solvents and absorbents. In warm-blooded animals it has no effect upon the heart, blood vessels, blood pressure, or vegetative smooth musculature. It increases the total metabolism. In the thyroid gland it distinctly reduces the colloid so that a thyrostatic effect results.

PLANCH (12)

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## SURGERY OF THE NERVOUS SYSTEM

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# INTERNATIONAL ABSTRACT OF SURGERY

DECEMBER, 1932

## ABSTRACTS OF CURRENT LITERATURE SURGERY OF THE HEAD AND NECK

### HEAD

Seydell, E. M. Sinus Thrombosis *Ann Otol, Rhinol & Laryngol*, 1932, xli, 466

Seydell states that the general symptoms of sinus thrombosis may continue for some time after ligation of the jugular vein and obliteration of the sinus. This is true especially of the fever.

In cases in which the fever subsides by lysis the prognosis is usually better than in those in which the temperature drops at once to normal and then rises again. A sudden drop in the temperature following the operation may signify collapse.

When blood cultures become negative after the operation, when the leucocytosis, especially the high percentage of polynuclear cells, diminishes after the operation, and when repeated Shilling blood counts reveal a steady turn to the right, the prognosis is relatively good.

JAMES C. BRASWELL, M.D.

Wilensky, A. O. Osteomyelitis of the Jaws *Arch Surg*, 1932, xxi, 183

Osteomyelitis of the jaws is a very common ailment. Mentioned in order of decreasing frequency of involvement, the bones most often affected by osteomyelitis are the femur, tibia, humerus, radius ulna, vertebrae, os calcis, and mandible. Of 450 cases of acute and chronic osteomyelitis treated at the Mt. Sinai Hospital, New York, in the period from 1924 to 1930, the jaws were involved in 39. In 8 of the latter the condition occurred in the upper jaw, and in 29 in the lower jaw. In the records of 2 cases the jaw involved was not clearly stated. Twenty-three of the 39 patients were males.

Osteomyelitis in children shows no essential differences from osteomyelitis developing in puberty or later life. Osteomyelitis in nurslings owes its peculiar clinical course merely to the anatomical location of the causative lesion, the relatively large extent of the consequent necrosis, and the extreme youth of the patient. In its pathogenesis and pathology it is exactly similar to osteomyelitis in older children and

adults. However, in younger subjects the bone has more spongiosa, and as long as there is growth there is a greater supply of blood and lymph. Therefore the incidence of hæmatogenous and odontogenous osteomyelitis is highest in younger subjects.

Osteomyelitis occurs at all ages, but osteomyelitis of definite bacterial origin is most common in childhood and adolescence. In young children the upper jaw is involved much more frequently than the lower jaw. Later this difference no longer exists. Ordinarily, necrosis occurs more frequently in the lower jaw than in the upper jaw because of the greater density of the bone and the difference in the blood supply of the lower jaw.

Cases of osteomyelitis of the jaw can be divided into a number of clinical groups and subgroups. In each of these groups there are cases in which odontogenous factors can be definitely excluded and cases in which such factors play a distinct rôle.

According to the mechanism, the cases may be divided into those in which the condition is primary in the jaw, those of involvement of the jaw due to extension of the infection, and those of involvement of the jaw of hæmatogenous origin.

Osteomyelitis is quite often primary in the jaws. Direct infection of the bone occurs as the result of trauma. According to the trauma, the lesions may be divided into those due to a blow or fall, those due to gunshot wounds, and those due to operative manipulations such as the wiring of fractures.

In most cases of osteomyelitis of the jaws the condition is the result of spontaneous extension of the infection along vascular channels from an area in close proximity to the bones. Subgroups of such cases are (1) those due to extension from a lesion in the attached soft parts, (2) those due to extension from a lesion in the gum, (3) those due to extension of odontogenous origin, and (4) those due to extension after an operative manipulation.

Hæmatogenous osteomyelitis of the jaws is a metastatic lesion developing during the course of a bacteraemia resulting from an acute bacterial lesion



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In most cases of osteomyelitis of the jaws the condition is the result of spontaneous extension of the infection along vascular channels from an area in close proximity to the bones. Subgroups of such cases are (1) those due to extension from a lesion in the attached soft parts, (2) those due to extension from a lesion in the gum, (3) those due to extension of odontogenous origin, and (4) those due to extension after an operative manipulation.

Hæmatogenous osteomyelitis of the jaws is a metastatic lesion developing during the course of a bacteraemia resulting from an acute bacterial lesion

on the surface of the body. The fundamental cause of the spread of the original lesion is an infected thrombus lying in the original area of infection and communicating at some point with the freely circulating blood. The organisms growing on the surface of the thrombus or pieces of the thrombus itself are discharged into the circulation. Bone tissue seems particularly prone to be blocked by these thrombo-emboli. Susceptibility to hematogenous osteomyelitis is particularly increased during the period of growth when the bones contain well-marked hyperemic areas at the junction of the diaphysis and epiphysis and around centers of ossification.

For the surgical treatment of osteomyelitis of the jaws a knowledge of the forms and varieties of suppuration about an osteomyelitic focus in the jaws and an understanding of the odontogenic factors involved are necessary. When a tooth is the site of an acute dento-alveolar abscess there is always considerable involvement of the bony structures at the apex of the root. The pus is at first confined to the apical space, where it is surrounded by bony walls. As it accumulates, disintegration of the surrounding cancellous bone takes place and a gradually increasing cavity is formed around the apex of the root. Such disintegration should not be classified as a form of osteomyelitis of the jaw unless secondary involvement with destruction of bone cells can be demonstrated in the jaw bone proper as a result of thrombophlebitic involvement of the vascular channels in the bone. As the buccal wall of the alveolar process is the thinnest, it offers the least resistance to the constantly accumulating pus. Therefore the abscess usually burrows through the external plate and points on the buccal aspect of the alveolar process opposite the apex of the root. Other possibilities may be summarized as follows:

1. The abscess may point directly through the soft tissues. Abscesses pointing through the gum tissues are the most common.
2. It may form a secondary pus pocket by separating the periosteum from the bone.
3. It may discharge at the margin of the gum by following the pericementum.
4. It may point toward the tongue.
5. It may point through the floor of the nasal fossa.

The physical characteristics of the area of bone necrosis that accompanies and follows osteomyelitis of the jaws vary directly with the site and importance of the vessel or vessels occluded by the osteomyelitic process.

The treatment of osteomyelitis of the jaws is discussed in detail. SAMUEL KARR, M.D.

Delmonro, E., and Driscoll, J.: The Intraglandular Lesion of Lithiasis of the Submaxillary Gland (*La lésion intraglandulaire de la lithiasis de la glande sous-maxillaire*). *Rev. de chir. Par.* 932, 2, 422.

The authors report three cases of intraglandular lithiasis of the submaxillary gland. The diagnosis

of this condition is quite difficult. The only treatment applicable is extirpation of the gland. Intraglandular calculi are rare and are inaccessible to direct or instrumental clinical exploration.

The authors' first case was that of a woman forty-three years of age who entered the clinic on account of a tumor in the submaxillary region on the right side. For about ten years she had noted the presence in the upper part of the neck of a gland which frequently varied in size but caused no symptoms. About a month after the removal of several carious teeth the gland increased in size, swelling because difficult and painful, phonation became disturbed, the tongue became stiff, and the sense of taste became impaired. In the diagnosis, ecchymosis, chronic submaxillary inflammation, and lymphatic phlegmon secondary to an alveolodental periodontitis were considered. The gland was removed. The stone which rested in a depression on its upper surface, was the size of a hazelnut, irregular and a clear yellow.

The second case reported was that of a woman sixty-two years of age who had a pocket of chronic suppuration opening into the mouth. The stone could not be determined. The gland was removed and with it a salivary calculus. The specimen showed no glandular formation.

The third case was that of a woman seventy years of age who had had a tumor of varying size in the right submaxillary region for six years. Three weeks before she was seen by the authors she had an attack of severe inflammation associated with an increase in size and reddening of the tumor, slight odors, pain which was increased by pressure, slight fever and insomnia. A diagnosis of lithiasis was made and the gland removed. Section of the gland revealed a calculus weighing 1 gram. It seems certain that this stone would have been visible in a roentgenogram.

Lithiasis of the submaxillary gland occurs more frequently in men than in women and is most common between the ages of forty and sixty years. The first cause is the presence of necro-organisms. The authors review the theories regarding the pathogenesis of the condition.

The progressive evolution of a simple infectious process secondary to a small intraglandular calculus may lead to septic complications or to atrophy of the gland. The treatment is surgical. The technique of the operation is described. FAYE

## ITE

Spewth, E. B. *Recent Biological Principles Which Underlie Ophthalmic Plastic Surgery*. In 1 Opht. 932 iv 240.

The author quotes Wilmore who states that the surgeon must possess great boldness in making the size of his flaps large and the removal of all scar tissue thorough, yet at the same time he must practice the most rigid economy in sacrificing normal tissue or normal skin. He must abrade the other

side of the face as closely as possible, dynamically and statically. He must also be prepared to sacrifice the lachrymal gland if such a course is necessary."

Ophthalmic plastic surgery is performed preferably under general anaesthesia. If local anaesthesia is necessary, block anaesthesia is used in preference to infiltration.

The method of sterilizing instruments and the operative field is described, but no mention is made of the conjunctival sac itself.

The most difficult part of plastic surgery is that done before the patient reaches the operating room. It is the careful planning necessary to obtain success.

In this article living tissue grafts as well as formalized cartilage are considered. The latter is said to have a definite rôle in plastic surgery. Relative to the use of paraffin, the author quotes Hunt as saying "Against such an outrage, for example, as the injection of paraffin into the human face with its attendant serious complications, no voice seems to be raised in even mild disapproval."

Free skin grafts can be conveniently divided into two general classes, the epidermal and the true skin or dermo-epidermal graft. The former includes the superficial epithelial cells with, in part, the median epithelial cells. The dermo-epidermal graft includes the malpighian epithelium with the subdermal connective tissue, skin capillaries, and the nerve endings of the peripheral nerves. The use of the pedicled flap is simply a convenient method of transferring a full thickness or dermo-epidermal graft from a contiguous region.

When non-formalized cartilage is used, it should be resected from either the lobe of the ear or from the seventh and eighth ribs at the sternal junction of these ribs and usually from the right side of the chest.

The rib is outlined by blunt dissection, the anterior, superior, and posterior surfaces all being well freed. The graft is then outlined with a small scalpel, a narrow bridge being left on the lower edge of the rib to preserve the intercostal nerves and blood vessels. The strip of intact perichondrium hastens healing. The outlined rib section is cut free with a costotome and the cartilage trimmed to the shape and size needed. All available perichondrium is conserved. This can be easily done if care is taken.

In its process of "taking," a graft is undoubtedly kept alive by the early formation of capillary loops from the bed into which it has been forced and held by the pressure of the dressing. Fibrin may also play a part in this process. However, a collection of blood serum beneath the graft is perhaps the cause of most of the failures in the use of free skin grafts.

Spaeth has never had any success with isografts of skin. It is possible that they have tissue reactions similar to the reactions which necessitate detailed typing and matching of donor and recipient in blood transfusions. Formalized cartilage persists when embedded, though perhaps only as a foreign body. Magitot has shown that after some time it

becomes infiltrated by bands of scar tissue, but in spite of some inevitable loss the major portion of the graft remains. Isografts of cartilage (the author has had no experience with isografts of bone) have been repeatedly successful. It is quite likely that the statement relative to formalized cartilage applies also to isografts of human cartilage.

There are only two basic methods for the utilization of free skin grafts. The grafts are either placed flat in the defect after it has been prepared for them by dissection or they are wrapped about a mold and buried in the defect. Dermo-epidermal grafts are applied much more frequently by the first than by the second method. Sutures are usually necessary with this type of graft. Epithelium must not be grafted upon the bulbar conjunctiva as the natural desquamations which occur may cause a chronic mechanical conjunctivitis. This statement does not apply if the eye is lost as an organ of vision.

The first essential is the resection of all scar tissue, both burned masses and bands and the very evident superficial portions. In the correction of ectropion with a dermo-epidermal graft, dissection for reception of the graft is done and the graft then lifted from its original bed, transferred to its new site, and sutured directly into position. The best example of this is the use of a free skin graft from the other lid.

The correction of a cicatricial ectropion with an epidermic graft is best illustrated by Wheeler's method, especially in a case in which the lid margin may be drawn to the level of the eyebrow. In such a case the scar is resected by incision and blunt dissection along the natural lines of cleavage, the lid margins are sutured together to form permanent intermarginal adhesions, and the graft is laid in one piece over the defects formed by the dissection. These intermarginal adhesions are left in position for from three months to a year while massage is applied to the reconstructed lids to prevent further cicatricial contraction.

The correction of an extropion involving only one lid is best carried out by Gillies inlay method.

This method is ideal also for the correction of a contracted socket. Because of the more or less marked conjunctival deficiency, it may be necessary to use pedicled flaps in these instances.

Free skin grafts are to be used only in cases in which there is a definite loss of soft tissue and it is probable that all scar tissue deposited in the defect can be removed. These include a large percentage of the cases which appear for correction, but not many of the more serious and more difficult cases, such as those with extensive loss of soft tissue, those of long standing with a large amount of cicatricial contracture which cannot be wholly eliminated, those without a firm base or a firm layer of normal tissue upon which the free skin grafts can be satisfactorily placed, and those in which the tissues contiguous to the defect are themselves contaminated with contracting cicatrices. Cases of the last type constitute the one positive indication for the

use of delayed pedicled flaps such as skin flaps from the neck and chest with long cervical pedicles.

The cutting of a flap produces, of necessity new and additional scar lines a fact to be considered when the patient is a young female. The edges should be cleanly cut up and down, though beveled, and the flaps turned upon themselves and then freed of any adherent subepithelial fat.

The flaps should be cut so that their long axis parallel the normal tension lines of the skin as they lie about the orbit, the lids, and over the malar and zygomatic processes. These tension lines follow absolutely the direction of the muscle scars of all of the muscles and ligaments which lie under the skin in this region.

Finger-like pedicled flaps from above the eyebrow, formed from the skin of the forehead or the hair-free skin over the temple, are usually quite satisfactory for the correction of cicatricial contracture, especially contraction ectropion of the lower lid with loss of considerable soft tissue.

Drinking of the outer canthal angle is easily corrected by a small finger-like flap. In cases of slight drooping of this type the author's modification of the classical Fuchs' tenorrhaphy gives good results. Trichiasis is corrected by a Z-shaped incision and the transposition of the two flaps thus outlined. Epicanthion is corrected by a similar method, the line of the palpebral fissure being elongated. One of two flaps which are outlined from the outer surface of the epicanthal fold is placed in the lower lid and the other in the upper lid. Blair does this most successfully.

Eyelashes may be replaced by means of a pedicled flap or a free skin graft from the other eyebrow a pedicled flap over the hair line at the temple, or best of all, a graft from the scalp. Occipital scalp grafts are rather thick. In the trimming of such grafts before they are placed in position, care must be taken not to injure the hair follicles as they appear upon the reverse surface of the graft. In trichiasis, partial or complete transplantation of the line of lashes is far better than either ablation or depilation. Eyelashes may be replaced by free skin grafts from the lower edge of the eyebrow.

The natural moist habitat of mucous membrane allows the transplantation of this membrane upon either bulbar or palpebral conjunctiva. The grafts must be trimmed very thin and applied snugly with sutures. Mucous membrane does not adjust itself well to correction when it is wrapped over a mould or upon a conformer. Paraffin may be used to fill in superficial defects but fat is of no permanent value for this purpose.

When cartilage or bone is necessary for the correction of a defect in the bony framework, close dissection is the first essential. It is important for a layer of fascia to overlie this graft in order that the line of skin sutures or pedicled flap sutures will not lie immediately above the graft. If this requirement cannot be met or is disregarded, failure is quite likely to result from secondary infection.

Permanent and serious corneal damage has occurred, possibly from retained conjunctival secretions, when laceromarginal incisions have been used or when it has been necessary to occlude an eye by a pressure bandage because of a free skin graft. Sutures must never be placed so that they lie in contact with the cornea. Outgait, afternoon, and bonneting will certainly cause trouble. Silk appears to be best tolerated in the conjunctiva.

Corneal damage is usually ushered in by pain beginning from forthright to seventy-two hours after the operation. When pain cannot be explained, the dressing should be removed, the operative site inspected, and a second dressing applied. When free skin epidermal grafts have been used, this will probably result in failure of the operative result, but corneal damage will be prevented.

The pressure applied to a dressing for the repair of a socket with free skin grafts must be well gauged as otherwise it may cause sloughing of the lids.

Infection in a graft or a flap is usually accompanied by pain and a rise in the temperature. In some cases the patient may become ill.

Cartilage repair and bone grafts should be dressed with pressure and a plaster of Paris bandage and the dressing changed on the tenth day. Cartilage and bone grafts should be dry and sterile dry. Gaping of the wound or even the appearance of serum from the wound is unsatisfactory. It is especially important that the wound be free from hemorrhage, even capillary oozing, before it is closed.

In the use of an appliance made to fit over the upper lid to avoid a contracted socket by pressure and, at the same time, by means of a superimposed plate to thin out a thick, unyielding reconstructed upper lid the principle of pressure atrophy is employed.

For pain the principle of mechanical support has been used. Elevating loops are attached to the upper rim of spectacles of such a size and height that the lid is elevated without uncomfortable pressure.

Buried white silk sutures have been repeatedly used for the correction of ptosis, for lagophthalmos, and in old facial paralysis with obliquity of the palpebral fissure. In the hooked suture of Amsveld, the upper end of a white silk suture is passed along through the upper lid parallel with the margin and the lower end is passed in the same manner through the lower lid. At the outer canthus the ends are crossed, tied with sufficient tension to produce the necessary correction, and then buried.

For inoperable defects, prostheses on spectacle frames are recommended. JAMES R. BROWN, M.D.

Stannells, B.: Some Notes on Orbital Tumors. *Arch. Ophth.*, 1931, 14, 248.

Stannells divides orbital tumors into the following eight groups:

Group 1: Tumors of slow growth producing a marked inflammatory reaction. Carcinoma. Cylindroma.

Group 2 Tumors of rapid growth producing little or no inflammatory reaction Sarcoma Hæmangioma Neurofibroma

Group 3 Tumors of the optic nerve Endothelioma Glioma

Group 4 Tumors invading the retrobulbar region by extension from within the globe

Group 5 Intra-ocular tumors escaping through the sclera without producing an inflammatory reaction.

Group 6 Metastatic tumors of the orbit Carcinoma Sarcoma

Group 7 Inflammatory pseudotumors of the orbit.

Group 8 Cases of exophthalmos in which no pathological process is evident anatomically.

In this article attention is paid more particularly to the manner in which the structures react to the tumors than to the morphology of the tumors themselves. Each type of tumor is discussed in detail.

*Carcinoma, Group 1* No other malignant growth in the orbit is likely to produce so much irritation in the structures invaded. Apparently because of the toxicity of their metabolism, the propagating tumor cells are commonly preceded by a lymphocytic infiltration in the adjacent tissues. As a result there are formed bands and membranes of connective tissue, scirrhous, which impede the advance of the tumor. It is striking that, like more highly organized structures, the muscles offer little resistance. In fact, the fibers usually show atrophic changes in advance of the carcinoma, so that the function of the muscle may be disturbed to a greater extent than would be expected from the size of the area replaced by the growth. The tendency of carcinoma to bring about the production of scirrhous is of considerable clinical importance. On account of the contraction of the newly formed connective tissue the eyeball may be drawn to one side and fixed to the wall of the orbit. This occurs in cases of rodent ulcer of the eyelid in old persons which has broken into the loose tissues of the orbit. One of the great dangers of surface tumors of the eyelids and of the limbus is the tendency of such neoplasms to invade the more areolar underlying tissues and thus to become retrobulbar.

*Cylindroma, Group 1* Cylindromata belong to the concealed tumors. They resemble basal-celled carcinomata, but appear to be less irritating than carcinomata. The associated exophthalmos is not apt to become very pronounced. Glaucoma results from interference with the venous outflow.

*Sarcoma, Group 2* The most common primary tumors of the orbit are sarcomata. These neoplasms seem to be better tolerated by the tissues. They are often encapsulated. Their ophthalmoscopic appearance suggests detachment of the retina.

*Hæmangioma, Group 2* Among the rarest neoplasms in the orbit are vascular tumors. These are dangerous because of their tendency to increase in size and to cause pressure atrophy of the orbital contents. They may affect even the bony walls of the orbit.

*Neurofibroma, Group 2* (von Recklinghausen's disease) Neurofibromata are likely to cause early reduction of vision by exerting pressure on the optic nerve and pushing the eyeball forward.

*Endothelioma, Group 3* In cases of endothelioma of the orbit exophthalmos and failing vision probably occur simultaneously. The circulation is disturbed because the endothelioma packs and dilates the sulcus of the intervascular space close by the papilla. The clinical changes in the fundus are probably caused first by œdema and engorgement of the vessels at the nerve head and later by detachment of the retina.

*Glioma, Group 3* Gliomata of the optic nerve originate in the neuroglia. Vision may be preserved for an indefinite time because of the survival of nerve fibers traversing the glomatous mass. In cases of neoplasm in the retrobulbar space pain is usually absent, probably because the pressure is never great, the globe being pressed forward in a compensating fashion.

*Tumors of Group 4* It was formerly believed that all intra-ocular tumors invade the eyeball from the orbit, but it is now known that the reverse is far more likely to be the case.

*Tumors of Group 5* Ordinarily, sarcomata attain the retrobulbar space by spreading along the emissaria or splitting the layers of the sclera. The tendency of intra-ocular sarcomata to undergo necrosis is of importance in the extension of these tumors into the orbital tissues. The necrotic material, being very toxic, may set up within the eye an inflammatory process as virulent as panophthalmitis with œdema of the lids and exophthalmos.

*Carcinoma, Group 6* Metastasis in the orbit may be manifested before metastasis in the brain. Metastatic carcinoma in the orbit occurs most frequently in the muscular tissue and generally involves more than one muscle. There is no inflammatory reaction. The metastatic focus of carcinoma is less toxic than the primary lesion.

*Sarcoma, Group 6* Metastatic sarcoma in the orbit is exceedingly rare.

*Tumors of Group 7* There is a type of exophthalmos of slow onset and due to chronic inflammation in the retrobulbar space which may so closely simulate the exophthalmos of true tumors that its clinical differentiation is practically impossible. While microscopic examination of the retrobulbar tissues reveals nothing definitely characteristic of syphilis, this condition has become less frequent since the use of the Wassermann test and of arsphenamin.

LESLIE L. MCCOY, M.D.

Pascheff, C. Researches on the Follicular Diseases of the Conjunctiva. *Am. J. Ophth.*, 1932, xv, 690.

The author distinguishes three types of follicular disease of the conjunctiva. The first, simple follicular conjunctivitis, is characterized by small superficial follicles arranged in rows which occupy both fornices and occasionally the tarsi. This condition heals completely, leaving no scar.



The second type of follicular disease of the conjunctiva—miliary follicular conjunctivitis—shows larger follicles, which are present in the bulbar conjunctiva and the cornea as well as the fornices. One of the author's cases terminated in xerophthalmos, and all of them showed scar formation and pannus.

The third type of follicular disease of the conjunctiva—conjunctivitis follicularis confusa—is better known as true trachoma. Trachoma always shows follicles. The follicles are confluent and develop on the conjunctiva as well as on the cornea. The condition always leads to distortion or hyaline degeneration.

Many cases of each type are cited. Paschall regards it as possible that true trachoma is an anaphylactic sign of latent tracheobronchial tuberculosis.

SAROTI A. DORR, M.D.

Law, F. W.: Uni-Ocular Zonular Cataract. *Brit. J. Ophth.*, 1932, xvi, 315.

Of twenty-two cases of uni-ocular zonular cataract reviewed by the author there was a history of a non-penetrating injury sustained before the age of twelve years in a very high percentage. In about half of those with such a history there was a dislocation of the lens. In only two did the cataract follow a penetrating injury. In one of these the injury was operative.

The author concludes that uni-ocular zonular cataract is due to trauma which is usually non-penetrating and of a type likely to produce dislocation of the lens. Dislocation of the lens occurs in about half of the cases. The layers of zonules of opacity characteristic of the condition are due to a temporary disturbance in the nutrition of the lens caused by physiological severance between the lens and its capsule with consequent alteration in the permeability of the capsule. Young, actively growing lenses are more subject to this type of opacity than adult lenses. There is no evidence that inflammation has any etiological relationship to the condition.

WILLIAM A. MANCE, JR., M.D.

Pieri, G.: Clinical Contributions to the Surgery of the Sympathetic Nervous System. VI. The Treatment of Retinal Angiogenesis (Contributi clinici alla chirurgia del sistema nervoso vegetativo. VI. La cura dell'angiogenesi retinica). *Arch. Ital. Clin.* 1932, xxii, 31.

Spasm of the central artery of the retina is more serious than is usually realized. It may lead to more or less complete loss of vision in the involved eye. The author believes it should be treated surgically and that the best operation is resection of the internal carotid nerve which is the vasomotor nerve supply of the branches of the internal carotid artery. A patient whom he operated upon by this technique has remained cured for more than two years. The operation is simple and not at all serious. The author's patient was discharged on the seventh postoperative day.

Studies of the physiology of the innervation of the vasomotor supply of the eye, the observations made after this operation, and experiments carried out on the cervical sympathetic (resection of the superior cervical ganglion, section of the sympathetic trunk between the cervical ganglia, resection of the stellate ganglion, peribulbar sympathectomy of the internal carotid) tend to raise considerable doubt as to existence of vasodilating fibers.

The author believes that operation on the vasomotor nerve supply may be indicated also in other affections, e.g., in some cases of retrobulbar optic neuritis, in ophthalmic hemianopia (the operation has already been done for ordinary sympathetico-tonic hemianopia) and in some of the neuropathic and psychopathic cerebral syndromes in which recent researches tend to show that vascular spasm is an important pathogenic factor.

ROBERT T. LEESE, M.D.

## EAR

Jenkins, G. J.: Paracocleus Willard and Some Clinical Features of the Otosclerosis Syndrome. *J. Laryngol. & Rhinol.*, 1932, xlii, 51.

The author states that the symptoms of paracocleus is possible only with the deafness syndrome found in most cases of otosclerosis. If it is associated with the deafness of any degree other than otosclerosis there must be changes in the auditory apparatus similar to those caused by otosclerosis. It is sometimes found with the deafness of congenital imperfecta and that of acustic deafness.

JAMES C. HANFORD, M.D.

Theising, G.: Pathologico-Anatomical and Experimental Studies on the Pathogenesis of Tuberculosis of the Middle Ear (Pathologisch-anatomische und experimentelle Untersuchungen zur Pathogenese der Mittelohrtuberkulose). *Zentr. f. Laryngol., Rhinol.* 1931, xxi, 314.

Following a critical review of the literature on the pathogenesis of tuberculosis of the middle ear, including the first site of tuberculous infection in the middle ear the pathogenesis of metastatic tuberculosis of the middle ear and the localization of tubercles in the cavities of the middle ear the author reports his pathologico-anatomical studies of 19 temporal bones from tuberculous children, youths, and adults.

It was definitely demonstrated that in generalized tuberculosis of hematogenous origin local growth always developed in the bone marrow especially in children. In the majority of the cases studied the bone marrow was the only site of the nasal tuberculosis. Therefore, one of the chief arguments against the hematogenous origin of tuberculosis of the ear, namely that isolated tuberculosis of bone has not been recognized, is shown to be fallacious. The objection raised by Bringer against a hematogenous origin—that the middle ear is not one of the typical areas involved in general miliary tuberculosis—

is refuted by the fact that involvement of the ear was found in all but 1 of the author's 19 fatal cases of generalized tuberculosis. The author's findings also support the theory of Koerner and Henrici that tuberculosis of the mastoid bone in childhood is of a primary nature.

In experimental studies of hæmatogenous tuberculosis of the middle ear which were carried out on 20 rabbits and 12 guinea pigs the author found changes which he believes were parallel to those seen in the human temporal bone. So far as it is possible to draw conclusions from experiments on animals, he concludes that his experimental findings support the theory that tuberculosis of the middle ear in man is of hæmatogenous origin and also the theory that the localization of the tuberculous process occurs primarily in the mucosa whether the condition is of hæmatogenous or tubal origin.

The article is supplemented by a bibliography of 163 references and 13 photomicrographs

HECHINGER (H)

## MOUTH

Martin, H. E. Cheiloplasty for Advanced Carcinoma of the Lip. *Surg., Gynec. & Obst.*, 1932, **lv**, 914.

The operation described is a method of constructing an entire new lower lip and chin. It is a modification of an operation first described by Bernard in 1853. It permits wide removal of the carcinoma, forms a functionally satisfactory new lower lip, and leaves minimal visible scarring.

A surgical procedure of this extent is not justified in the presence of large, multiple, or bilateral metastases. In the presence of a single small metastasis it should be proposed with caution and the surgeon must assume the responsibility of adequate removal of the metastasis. The operative exposure will permit limited removal of gland-bearing tissue from the submental and submaxillary regions, but not an extensive neck dissection.

The excision of a rectangular or square segment of the lower lip, the formation of two lateral cheek flaps mobilized from the mandible, the excision of full thickness triangles above and lateral to the angles of the mouth, and conservation of the mucosa of these triangles to form the vermillion border of the new lower lip were all first described by Bernard in 1853.

The author is of the opinion that the simple V-shaped operation should never be used as the primary treatment.

He states that inferior cheiloplasty should always be done with the use of full-thickness flaps of cheek or lip. Methods utilizing flaps of skin from the neck are more subject to failure and in cases in which the lower lip is involved will give much less satisfactory functional and cosmetic results.

In the formation of the new lower lip provision must be made for an adequate gingivobuccal gutter as unless this is done drooling of saliva will result.

In the average case the incisions from the vermillion border of the lower lip on either side of the growth should run vertically to the lower edge of the mandible. If, because of wide extent of the growth, they must be begun lateral to the labial commissures, they may be inclined mesially to a slight extent.

Blocking of the third division of both fifth cranial nerves and of both infra-orbital nerves with a 2 per cent solution of novocain will anesthetize all of the operative field except, to some extent, the rather limited incisions below the lower borders of the mandibles. In the latter region local infiltration is sufficient.

The operation is begun by making two incisions from the free border of the lip downward to the lower border of the mandible. These should be at least 1 cm. lateral to any visible or palpable evidence of disease. A third incision is made in the bottom of the gingivobuccal gutter and the dissection is rapidly carried down, the tissues being freed in this manner from the mandible anteriorly and the periosteum being removed if there is any question of deep invasion.

Next, the two horizontal incisions are continued directly backward as viewed from the sagittal plane, for a distance of about 3 or 4 cm. They outline the lower edges of the two lateral plastic flaps. Mobilization of these lateral flaps necessitates next the incision of the mucosa in each lower gingivobuccal gutter. These mucosal incisions are carried back to or beyond the last lower molars or even up along the anterior borders of the ascending rami.

The next step consists in excising triangles of tissue above and lateral to the labial commissures. As these triangles are excised, the mucosa is left attached to the base. Later they are turned forward, trimmed, and sutured to form the vermillion border of the new lower lip.

Closure is begun by suturing the incisions in the lower gingivobuccal gutters. The first stitch is placed entirely on the gingival side at the posterior limit of the incision. Subsequent sutures stretch the mucosa more and more anteriorly, so that eventually its tip will reach the midline. After the mucosa has been sutured to about the position of the cuspid tooth, the mucosal side of the triangle is sutured. The closure of the opposite side is then brought to the same stage of completion. Suture of the flaps in the anterior gingivobuccal gutter is done next, being continued up the midline and over the free border of the lip along the skin edges to the point of the chin. The vertical wounds above the commissures are then closed and mucosal flaps from the triangles are trimmed and sutured over the raw surfaces of the new lower lip.

The last stage of the operation is the adjustment of the submental skin flap.

If the growth extends widely on the inner surface of the lip and onto the alveolar ridge, a segment of the upper border of the alveolar ridge and mandible may be removed by a motor saw.

In complete resection of the lip, repair is made by turning down two Randaller flaps and uniting them in the midline. When this is done the mouth becomes quite narrow and a plastic operation must be performed later to widen it. If the growth is entirely unilateral and involves the commissure, the procedure may be modified by the use of an Randaller flap from the same side, either with or without excision of a Bernard triangle on the other side.

The modified Bernard operation described for centrally situated advanced carcinoma of the lip has been done in seven cases. JAMES B. BROWN M.D.

Browne, D.: The Operation for Cleft Palate. *Brit. J. Surg.* 193 22, 7.

The mechanism which closes the nasopharynx is the same as that which closes so many other passages in the body—a complete muscular ring or sphincter. This sphincter can be separated into anterior and posterior halves. The posterior sling is made up of the superior constrictor and the palatopharyngeus which, by simultaneous contraction, produce the shelf on the posterior wall of the pharynx known as "Palmar's ridge".

The anterior sling consists of the two levators and the two tensors of the palate. The levators lift and draw back the center of the palate against the posterior half of the sphincter but the tensors, instead of helping this action as the palatopharyngeus helps the action of the superior constrictor act in definite opposition to it.

The aim of operation in cases of cleft palate is the formation of a contractile ring capable of closing the nasopharyngeal passage.

In cleft palate the area of epithelium is increased, the mass of the tissues is diminished, and there is never enough tissue present to make a palate of normal fullness even though one of normal function can usually be produced.

Therefore it is not only permissible, but imperative, to remove large amounts of mucosa from the surfaces to be joined. Failure to do this is one of the most common causes of a result in which the soft palate consists mainly of mucosa which should have been removed at operation.

The sacrifice by the Brophy operation of the germs of the permanent teeth by leaving aseptic wires among them for long periods is too high a price to pay for easier joining of the palate.

Breakdown of the line of junction after operation almost invariably starts at the junction of the hard and soft palates for the following reasons:

1. The clefts are at their widest at this point.
2. There is in this region a sudden change in the substance and shape of the tissues to be joined.
3. The three strongest anchorages of the flaps to be joined are here.
4. As the muscles of the soft palate pull backward as well as upward on the line of healing, any split due to their action will begin at the anterior border of the muscular ring rather than at the posterior border.

It must be borne in mind that the production of a simple stiff partition between the nose and the mouth which merely succeeds in dealing with the hard palate, means failure in dealing with the soft palate.

As the nasopharynx of the hard palate is practically unstretchable, it must be shifted in one way or another to cover the central cleft.

If the nasopharynx is boldly detached from the alveolar ridge along its outer border so that it is left attached merely by its anterior and posterior ends, it can be pulled inward to any extent required by the width of the cleft and still left in contact with the underlying bone.

It is obvious that the wider the area of contact between the raw surfaces of the flaps the better the chance that they will join together rapidly and firmly.

The solution of the problem of the disposal of the posterior palatine artery appears to be the deliberate arrangement of an adventitious circulation to replace the natural circulation by cutting the posterior palatine artery at a preliminary operation.

If the hard palate is dealt with in the way recommended, it will be found that the sides of the gap in the soft palate are almost or quite in contact and need only light coaptation sutures to hold them together.

The operation for closure of the soft palate is essentially an operation of muscle transposition.

The rigid bony framework of the pharynx is of normal size and the muscles available are short and atrophic. Liberation of the levator palati is very enough, but the turn of the tendon of the tensor palati around the hamular process not only fixes it firmly to the boundaries of the nasopharynx but changes its direction so that it pulls directly forward against the line of junction. It is fortunate that the hamular process can be very easily snipped off at its base without interfering with the symphyseal growth of the palley and can thereby be displaced forward and upward to a position which will not interfere with the joining of the two tensors. In this new position it must finally become fixed by the healing processes to afford once more a fulcrum for the tendon that curls around it.

The provision of a broad healing surface is so important in the soft palate as in the hard palate. This is best accomplished by freely removing mucosa which is present in excess.

There is fortunately no danger of cutting the main arteries of supply to the soft palate. If the mobilization is sufficient there is no necessity for tension sutures, tapes, or metal devices which would eventually interfere with the supplying vessels and destroy important tissues.

Before the cleft is joined it is necessary to rearrange the blood supply by cutting the posterior palatine artery. To reduce the danger of infection the tonsils should be removed.

At least three months should be allowed after the preliminary operation for the restoration of all inflammation before the main operation is performed.

At the time of the main operation the child should be free from colds and in as good general health as possible. There is much to be said for considering it best to perform the operation during the summer.

In every case both divisions of the palate, the hard as well as the soft, should be completely mobilized.

The lateral incisions follow the lines described by Addison, dividing the mucosa along the whole length of the pterygomandibular raphe and then running forward close to the inner edges of the teeth to about the level of the incisor. The soft palate is freed from the buccinator and pterygoid muscles by blunt dissection along its outer side to a depth of a centimeter or more. On the inner wall of this incision the hamulus of the pterygoid can be plainly felt, just as it can be felt through the upper end of the gap left by removal of the tonsil. It should be snapped off inward.

Next, the mucoperiosteum of the hard palate is levered from the bone by the dissector. As the posterior palatine artery has been previously cut, there is no obstacle to complete and rapid freeing of this flap.

The last stage in the liberation of the palate is its separation with the curved scissors and the dissector from the posterior edge of the bony palate—a procedure which is facilitated by the previous division of the posterior palatine artery. Mobilization has been accomplished properly when the sides of the cleft tend to fall together and can be pushed into contact with the very lightest pressure.

In the suturing of the hard palate the edges must be drawn together by vertical mattress sutures of strong silkworm gut until at least 5 mm of the raw surface on either side are in apposition.

In the suturing of the soft palate the handling of the flimsy edges is greatly aided by passing a fine suture through the tip of each half of the uvula. With the fine-pointed knife, a strip of mucosa is carefully sawed off of the edge of the cleft. This strip broadens from about 4 mm near the uvula to about 8 mm where it meets the anterior raw surfaces.

The nasal surface of the soft palate is joined by interrupted sutures. The first of these, the most important in the whole operation, join firmly and accurately the angles caused by the sudden swell of muscle from the thin mucoperiosteum of the hard palate. The oral surface is next joined by half a dozen stitches. Whitehead's varnish or any similar preparation does not make the suture line waterproof, but tends to collect and confine the exudate.

After the operation the child should be kept as contented as possible and given soft food and an abundance of glucose water.

There is no danger that the wound will be broken down by the tongue. The only complication to be feared after the operation described is sepsis of the corroding type, which will break down any wound in which it occurs.

JAMES B. BROWN, M.D.

Moure, P. End-Results of Surgical Treatment of Cancer of the Tongue (*Résultats éloignés du traitement chirurgical du cancer de la langue*) *Bull. et mém. Soc. nat. de chir.*, 1932, LVIII, 867.

The cancers of the tongue treated by Moure in the period between 1920 and 1930 may be divided into two groups—fifty-three clinically evident lesions and twelve small beginning cancers or suspicious lesions. In five of the sixty-five cases histological examination of a part of the specimen failed to reveal cancer. In these five the lesion was small and operation consisted of non-mutilating exeresis. One of the small lesions recurred and necessitated a second operation. The second operation resulted in cure.

In three of the sixty-five cases the treatment included irradiation and surgery, the glands being extirpated surgically after the lingual lesions had been treated with radium. The three patients died of rapid recurrence with diffuse cancerous cellulitis of the neck.

The remaining fifty-seven cases in which the nature of the lesion was proved by histological examination were treated surgically. All of the lesions except two, which were predominantly basal-celled, were spinous-celled epitheliomata.

In four cases the cancer was situated at the tip of the tongue, in twenty-three, on its anterior margin, in nine, on its median margin, in nine, on its posterior margin, and in twelve, on the lower surface of the tongue and the floor of the mouth.

There were sixteen operative deaths. In four cases in which operation was done by the lateral infrahyoid route there were three deaths. The author decided to abandon this method.

Of the sixteen operative deaths i.e., deaths occurring within the first two months after operation 2 were due to secondary hæmorrhages and fourteen to infection with bronchopneumonia and septicæmia. In the thirty-five cases operated upon in the period between 1920 and 1923 there were ten deaths, a mortality of 28.74 per cent, and in the thirty operated upon between 1923 and 1930 there were four deaths, a mortality of 7.5 per cent. The decrease in the mortality was due no doubt to (1) improvement in the operative technique, e.g. operation in two stages, (2) the use of the electrical bistoury and of regional anæsthesia and (3) post-operative arsenical treatment.

Of thirty-nine patients who were operated on for cancer of the tongue which was verified histologically and were traced up to January, 1932, fourteen died of recurrence and twenty-five had no recurrence. Of the latter, twenty-three are living, one died six years after the operation, and one died of cancer of the uterus eight years after the operation. Most of the deaths from recurrence occurred before or during the second year.

The twenty-three cured patients who have been traced included seven with small beginning lesions and sixteen with clinically apparent cancers. Five of these patients have remained free from recurrence.

In complete resection of the lip, repair is made by turning down two Estlander flaps and suturing them in the midline. When this is done the mouth becomes quite narrow and a plastic operation must be performed later to widen it. If the growth is entirely unilateral and involves the commissure, the procedure may be modified by the use of an Estlander flap from the same side, either with or without excision of a Bernard triangle on the other side.

The modified Bernard operation described for centrally situated advanced carcinoma of the lip has been done in seven cases. JAMES R. BARNES, M.D.

Brown, D. The Operation for Cleft Palate. *Brit. J. Surg.* 1934, 22, 7.

The mechanism which closes the nasopharynx is the same as that which closes so many other passages in the body—a complete muscular ring or sphincter. This sphincter can be separated into anterior and posterior halves. The posterior sling is made up of the superior constrictor and the palatopharyngeus which, by simultaneous contraction, produce the shelf on the posterior wall of the pharynx known as Passavant's ridge.

The anterior sling consists of the two levators and the two tensors of the palate. The levators lift and draw back the center of the palate against the posterior half of the sphincter but the tensors, instead of helping this action as the palatopharyngeus helps the action of the superior constrictor, act in definite opposition to it.

The aim of operation in cases of cleft palate is the formation of a contractile ring capable of closing the nasopharyngeal passage.

In cleft palate the area of epithelium is increased, the mass of the tissues is diminished, and there is never enough tissue present to make a palate of normal fullness even though one of normal function can usually be produced.

Therefore it is not only permissible, but imperative, to remove large amounts of tissue from the surfaces to be joined. Failure to do this is one of the most common causes of a result in which the soft palate consists mainly of scar tissue which should have been removed at operation.

The sacrifice by the Brophy operation of the germs of the permanent teeth by leaving septic wires among them for long periods is too high a price to pay for water joining of the palate.

Breakdown of the line of junction after operation almost invariably starts at the junction of the hard and soft palates for the following reasons:

1. The clefts are at their widest at this point.
2. There is in this region a sudden change in the substance and shape of the tissues to be joined.
3. The three strongest anchorages of the flaps to be joined are here.
4. As the muscles of the soft palate pull back ward as well as upward on the line of healing, any split due to their action will begin at the anterior border of the muscular ring rather than at the posterior border.

It must be borne in mind that the production of a simple stiff partition between the nose and the mouth, which means success in dealing with the hard palate, means failure in dealing with the soft palate.

As the mucoperiosteum of the hard palate is practically unstretchable, it must be shifted in one way or another to cover the central cleft.

If the mucoperiosteum is boldly detached from the alveolar ridge along its outer border so that it is left attached merely by its anterior and posterior ends, it can be pulled toward to any extent required by the width of the cleft and still left in contact with the underlying bone.

It is obvious that the wider the area of contact between the raw surfaces of the flaps the better the chance that they will join together rapidly and firmly.

The solution of the problem of the disposal of the posterior palatine artery appears to be the deliberate arrangement of an adventitious division to replace the natural circulation by cutting the posterior palatine artery at a preliminary operation.

If the hard palate is dealt with in the way recommended, it will be found that the sides of the gap in the soft palate are almost or quite in contact and need only light compression sutures to hold them together.

The operation for closure of the soft palate is essentially an operation of muscle transplantation.

The rigid bony framework of the pharynx is of normal size and the muscles available are short and atrophic. Liberation of the levator palati is easy enough, but the turn of the tendon of the tensor palati around the hamular process not only does it firmly to the boundaries of the nasopharynx but changes its direction so that it pulls directly forward against the line of junction. It is here that the hamular process can be very easily snapped off at its base without interfering with the normal shape of the palate and can thereby be displaced forward and upward to a position which will not interfere with the joining of the two tensors. In this new position it must finally become fixed by the healing processes to afford once more a fulcrum for the tendon that curls around it.

The provision of a broad healing surface is as important in the soft palate as in the hard palate. This is best accomplished by freely removing scar tissue which is present in excess.

There is fortunately no danger of cutting the main arteries of supply to the soft palate. If the mobilization is sufficient there is no necessity for tension sutures, tapes, or metal devices which would seriously interfere with the supplying vessels and destroy important tissues.

Before the cleft is joined it is necessary to rearrange the blood supply by cutting the posterior palatine artery. To reduce the danger of infection the tonsils should be removed.

At least three months should be allowed after the preliminary operation for the resolution of all inflammation before the main operation is performed.

mary malignancy of the lung or a bronchus, metastasis from carcinoma of the breast, pelvis, or rectum, and sarcoma (Hodgkin's disease) In all of the cases the paralysis was unilateral.

Of 24 cases of aortic aneurism, the paralysis involved the left cord in 19, the right cord in 1, and both cords in 4.

In 10 cases the paralysis could be ascribed to a cardiac lesion In 3 of these the diagnosis was adhesive pleuropericarditis In 1 case this was associated with emphysema and in another with dilatation of the aorta and innominate artery In 7 cases the diagnosis was chronic mitral endocarditis with stenosis and dilatation or dilatation and hypertrophy of the left auricle.

In 11 cases the paralysis was due to a tuberculous condition of the thorax. In all of these it was unilateral.

In 26 cases the patient was re-examined after an interval varying from a few weeks to a number of years From these cases the authors draw the following conclusions

1 A vocal cord with partial paralysis (of the so-called abductor type) may completely recover function

2 A vocal cord fixed in the median line may completely recover, but usually remains in that position

3 A vocal cord fixed in the cadaveric position may completely recover, but usually swings to the median line within a few months and remains there.

In 6 cases there was partial or complete recovery In all of these the paralysis was bilateral In 12 cases the affected cord was in the median line and remained there In 6 cases there was a change from the cadaveric position to the median line position. In 5 of these the lesion was unilateral

In 2 cases there was no change in the cadaveric position

In 43 cases in which the cord was in the median line the average duration of symptoms was seventeen months, and in 49 cases in which the cord was in the cadaveric position the average duration of symptoms was only ten and a half months

Of the total number of 217 cases, both cords were affected in 32 The left cord was paralyzed in 127 cases, or more than twice as often as the right cord, which was paralyzed in 58

In addition to the 217 cases in which the cause could be determined, there were a fairly large number in which the cause could not be determined

The authors conclude that paralyzed vocal cords in the cadaveric position usually change from this position to the median line within a few months, with return of the voice If the condition is bilateral, dyspnoea develops as the voice improves

Vocal cords in the median line may return to complete function, but most of them remain in the median line

None of the vocal cords observed in the median line changes to the cadaveric position

for ten years, two for nine years, one for seven years, one for six years, three for five years, three for four years, one for three years, and seven for two years. These who have been cured for from two to ten years constituted 40 per cent of the fifty-seven with histologically verified cancer.

PAGE.

## NECK

Prusnal, E. O., Montejo, B., and Galdin, A.: The Thyroid and Hemoglobin Metabolism (*El tiroides y el metabolismo hemoglobínico*). *Med. Univ. Chile*, 1935, xvi, 973.

The relationship between the thyroid and hemoglobin metabolism is manifested by the anemia which accompanies myxedema and may be associated with edema, changes in the secretion of biliary pigment, the formation of calculi, and a decrease in the elimination of ureobilia. The authors review a series of cases in which a low basal metabolic rate was accompanied by anemia and a decrease in the ureobilia excretion. In the patients treated with thyroid extract the hemoglobin level and ureobilia output rose with the basal metabolism.

Hyperthyroidism is characterized by excessive activity of the mesenchymal tissues, particularly of the hematopoietic system. The authors review a series of cases in which hyperthyroidism was associated with hyperfibrinogenemia and evidences of hepatopathy and the ureobilia output was increased. That these changes are not due to impairment of the circulation was shown by a series of cases of hyperthyroidism with a normal pulse rate and blood pressure in which both an increase in the metabolism and the phenomena of hyperfibrinogenemia were demonstrable.

Splenomegaly has frequently been noted in hyperthyroidism. In a study of the effect of the administration of splenic extract upon the metabolism of patients with hyperthyroidism the authors noted a fall in the basal metabolic rate and a decrease in the fibrinolytic content of the blood and the output of ureobilia. These findings suggest that in patients with hyperthyroidism there is a constitutional anomaly of the mesenchyme particularly of the reticulo-endothelial and hematopoietic systems. Treatment of the hyperthyroidism decreases the hemoglobin metabolism and lowers the blood pressure.

LEO M. ZIMMERMAN, M.D.

Smith, J. H.: Solar Radiation in Relation to Endemic Goiter. *Arch. Int. Med.* 41, 1, 75.

The influence of iodine in the prevention of simple goiter depends less upon the amount of iodine available than upon the quantity that is utilized by the organism. Many factors are concerned in the utilization of iodine in goiter prevention. One of the important factors is solar radiation. Experimental evidence tends to show that a lack of solar radiation may cause a deficiency of the iodine content of the thyroid gland as the result of deficient irradiation of air, soil, food, or drinking water or the skin of the

organism. This is borne out clinically by the incidence in the United States of areas of endemic goiter and regions of deficient sunlight. A study of goiter distribution in India reveals a similar relationship. In a goiter survey of New Zealand similar findings were made and it was noted that the iodine content of the soil was roughly proportional to the solar radiation. In regions where the iodine content of the soil was low the incidence of endemic goiter was in fairly close inverse proportion to the radiation index. Studies made in South Carolina revealed that the iodine content of iodine in potatoes varies with solar radiation, a fact suggesting that sunlight may have some effect upon the iodine content of vegetables.

LEO M. ZIMMERMAN, M.D.

New, G. R., and Childrey, J. H.: Paralysis of the Vocal Cords: A Study of 317 Medical Cases. *Arch. Otolaryngol.*, 1935, xvi, 143.

The authors report a study of 317 cases of paralysis of the vocal cords seen at the Mayo Clinic.

Among these there were 3 cases of paralysis of congenital origin in which laryngeal symptoms had been present since birth. In all, the involvement of the cords was bilateral.

In 34 cases the paralysis could be attributed to intracranial lesions. In 9 of these the lesions were syphilitic. Of the 15 cases in which the paralysis was due to a non-syphilitic intracranial lesion, it was bilateral in only 3 and in all of the latter it was of the abductor type. Of the 12 non-syphilitic cases in which it was unilateral, it was on the left side in 9. In the 3 cases of non-syphilitic unilateral paralysis the position of the affected cord was definitely noted 3 times.

In 9 cases the paralysis could be ascribed to tabes. It was bilateral in 6.

In 6 cases toxic neuritis seemed to be responsible for the paralysis. The laryngoscopic findings were variable.

In 13 cases the syndrome of the laryngeal form was caused by a malignant tumor and vocal cord paralysis. In all, the paralysis was unilateral. In 10 cases it was on the right side.

There were 34 cases of proved carcinoma of the hypopharynx or esophagus which caused fixation of the vocal cord. In 31 of these cases the paralysis was unilateral.

In 10 cases the paralysis was the result of tertiary syphilis of the larynx. In 6 of these cases both cords were affected.

In 4 cases the paralysis was due to a cervical tumor. As would be expected, it was unilateral in all.

In 35 cases the paralysis was due to a benign goiter and in 10 to a malignant goiter. Of the benign goiters, 3 were subtotal. In 46 of the cases of goiter the paralysis was unilateral.

There were 4 cases of recurrent paralysis secondary to accidental trauma to the neck, the result of a fall.

In 30 cases the paralysis was attributable to mediastinal disease. The conditions in all included pri-

tube are pushed down over the cannula and into the cavity. The cannula and sleeve are then withdrawn and the pus is drained through the silver tube. A soft rubber tube is then inserted through the silver tube and the silver tube is withdrawn.

Of the patients whose cases are reviewed, two died because operation was too long delayed and fourteen died because operation was performed too early. The causes of death in the operative cases in which encapsulation had occurred included pressure cone and medullary collapse, meningitis following an attempt at marsupialization, multiple abscesses, internal hydrocephalus following imperfect drainage and fungus cerebri.

The following conclusions are drawn

- 1 Abscesses of the brain are no more difficult to localize than other intracranial lesions
- 2 Abscesses of the brain should not be opened before encapsulation has occurred—preferably not before the sixth week after the onset of symptoms
- 3 Drainage by a soft rubber tube is satisfactory

JOHN W. EPTON, M D

Grant, F C. Ventriculography and Encephalography. Their Value in the Localization and Treatment of Intracranial Lesions. *Arch Neurol & Psychiat*, 1932, xxvii, 1310

Grant presents an analysis of 325 encephalograms and 160 ventriculograms. As the size of the ventricles and subarachnoid spaces differs markedly in different persons, he believes it impossible to foretell in a given case the exact amount of fluid that must be drained to obtain an encephalogram which completely outlines the intracranial spaces. He emphasizes that successful results are assured only after all of the fluid that can possibly be removed is withdrawn. In agreement with most other workers in the field, he believes that the choice between the direct ventricular and the lumbar injection of air must depend upon the presence or absence of increased intracranial pressure. In the presence of increased intracranial pressure, ventriculography is indicated, and in its absence, encephalography. Therefore ventriculography should be used in cases in which a diagnosis of brain tumor or abscess is made in the absence of localizing signs, and encephalography in cases in which a tumor is suspected in the presence of little or no increase in the intracranial pressure and in cases of other unlocalized organic cerebral diseases.

With regard to the technique of ventriculography, Grant emphasizes only the importance of tapping both ventricles as this often yields information which makes the injection of air unnecessary. He urges that a tumor which has been localized by the aid of ventriculography be removed as soon as possible as in this way the mortality from the diagnostic procedure can be reduced. He attributes the higher mortality from the injection of air into the ventricles as compared with that of the lumbar injection of air entirely to the choice of cases in which the procedure is used.

Encephalography is best done by the simplest method possible. Grant has found that the degree of unpleasant after effects is not reduced by reducing the fluctuation in pressure. He usually makes all X-ray exposures with the patient in the sitting position. Encephalography is of value to the neurological surgeon chiefly to indicate the absence of a need for surgical intervention. When a lesion such as a tumor, abscess, clot, internal hydrocephalus, porencephalic cyst, or post-traumatic scar pulling the lateral ventricle toward the cortex is ruled out, encephalography ceases to be of value in the differential diagnosis as there is no encephalographic picture typical of any organic disease of the brain.

In a study of epilepsy, post-traumatic epilepsy, and post-traumatic headache from the point of view of encephalography, Grant found a definite abnormality in the encephalographic shadows in 95 per cent of the cases of post-traumatic epilepsy and in about 75 per cent of the cases of epilepsy of the other type. Moreover, about 45 per cent of the cases of post-traumatic epilepsy showed asymmetry of the ventricles whereas in the cases of epilepsy of the other type the chief abnormality was "atrophy" shown by dilatation of the subarachnoid spaces.

In cases of post-traumatic headache a fairly uniform picture of dilatation of the subarachnoid spaces as well as of the ventricles was found. This fact led Grant to conclude that the headache may be due to distention of these spaces by fluid. In 14 of 41 patients with such headaches who were followed from a month to two years after encephalography the headaches ceased completely.

LEO M. DAVIDOFF, M D

Brock, S., and Dyke, C G. Venous and Arteriovenous Angiomata of the Brain. *Bull Neurological Inst New York*, 1932, ii, 247

Brock and Dyke present a review of the literature on blood vessel tumors and malformations of the brain calling especial attention to the work of Lindau, Cushing and Bailey, and Dandy. These lesions may be divided into the hemangiohistiomas, which form a group of true neoplasms, and the venous and arteriovenous so-called "angiomata" which are in reality not new growths but simply congenital anomalies of the cerebral blood vessels.

Eight cases of angioma are reported by the authors—three of the venous and five of the arteriovenous type. The important features of these cases are summarized as follows:

- 1 In four cases extracranial vascular lesions co-existed. An unusual instance of venous angioma of the retina, chiasm, midbrain, and cerebellum is described.

- 2 The important eye signs were homonymous hemianopsia and unilateral exophthalmos.

- 3 In the arteriovenous variety the cardiovascular phenomena were of diagnostic significance. They included enlargement of intracranial, cranial, extracranial, and carotid arteries and of the heart, a systolic mitral murmur, and a mild degree of tachy-



# SURGERY OF THE NERVOUS SYSTEM

## BRAIN AND ITS COVERINGS; CRANIAL NERVES

Loewenstein, K., and Mendel, K.: Brain Injuries from the Action of Electricity. *Electrotraumatische Encephalomyelosen* (Hirnschädigungen durch elektrische Elektrizität; Elektrotraumatische Encephalomyelosen). *Deutsche Zeitschr. f. Nervenheilk.* 1932, cxvii 311.

Electricity has a particular affinity for nervous tissue and in the central nervous system frequently produces diffuse and multiple lesions which, according to their distribution and severity, gives rise to a wide variety of syndromes. Particularly frequent are symptoms of interrupted nerve and psychic function producing pictures similar to paralysis, also syndromes which stimulate epilepsy and multiple sclerosis. A syndrome that may be considered in a sense characteristic of electrical trauma is constituted of symptoms of multiple sclerosis with papillary disturbances and psychic deficiencies of a paralytic character, neurotic symptoms, and sometimes epileptic phenomena. All tests of the blood and cerebrospinal fluid for syphilis must be negative. To designate these disturbances, the authors suggest the term "electrotraumatic encephalomyeloses."

The papillary disturbances are of great importance in the diagnosis. After an interval a difference between the pupils and a delay in reaction up to true loss of the reflexes are found. Paralysis of the muscles of the eye, ptosis, and atrophy of the optic nerve may also occur. The papillary disturbances play a leading rôle in the development of the clinical pictures simulating paralysis. Before the introduction of the Wassermann test, they usually led to the diagnosis of true paralysis.

Electrical trauma may give rise to papillary disturbances alone or associated with other phenomena of interrupted nerve function. The authors emphasize that as loss of the papillary reflexes has recently been demonstrated in epidemic encephalitis and alcoholism, the theory that it is always due to syphilis must be rejected. Recently also, traumatic papillary disturbances and papillary disturbances in infectious neuritis (Gorgely) have been reported. In an attempt to explain these papillary disturbances by an affection of the superficially located papillomotor fibers in the tracts of the optic nerve, which may be injured by hemorrhages into the subarachnoid spaces and by traumatic exudate. As in electrotraumatic injuries the papillary disturbances are associated with a number of other cranial nerve injuries and with necrotic lesions of the spinal cord, the authors are inclined to believe that they are produced by necrotic lesions in the same way as the well-known electrotraumatic injuries of the gray matter of the spinal cord. Krüger (9).

Grant, F. C.: The Mortality from Abscess of the Brain. *J. Am. M. Ass.* 1932, xcix, 509.

Of fifty-one proved cases of abscess of the brain, accurate localization was possible in thirty-abscess. In four cases the localization was correct, but the pre-operative diagnosis was brain tumor. Thus localization was accurate in forty-three, approximately 84 per cent. Errors in localization and delay do not account for the high mortality of 51.8 per cent.

Surgeons in general have learned not to open abscesses until the walling-off process has taken place, but in the brain this process is slow because of the lack of fibrous tissue elements.

The development of an abscess in the brain is similar to that of an abscess elsewhere in the body. Infection is implicated, surrounding cells die, and leucocytes surround and invade the infected area. Cerebritis, local tissue necrosis without pus formation, occurs and is followed by liquefaction of the center of the infected area with eventual encapsulation through the participation of the slowly acting glial tissue.

In the cases reviewed by the author in which operation was performed before encapsulation had taken place the mortality was 100 per cent. The only criteria by which the occurrence of encapsulation may be judged are the duration of the symptoms and the questionable evidence yielded by fundoscopic examination. From the experience in the cases reviewed it appears that the occurrence of encapsulation requires no less than from four to six weeks. To carry the patient over this length of time it may be necessary to combat increased intracranial pressure by the intravenous injection of hypertonic solutions and in some cases to make a trephine opening over the site of the abscess to permit an emergency tap.

In the drainage in the cases reviewed the following three principles were adhered to as closely as conditions would permit.

1. Whenever possible a small opening instead of a large flap was made.

2. The operation was carried out in two stages. The trephine opening was made as close to the abscess as possible, the dura was opened, and packing was introduced into the wound to promote the formation of adhesions.

3. The abscesses were drained with a soft rubber tube.

The instruments used included an exploring cannula of double length over which fits a sleeve with its lower end conical and tapering off to the exact size of the cannula. The sleeve carries snugly fitting silver tubes of varying diameters. When an abscess is located with the cannula, the sleeve and a silver

dilatation and enlargement of the third ventricle downward and forward so that it impinges upon the pituitary region. First, the dorsum becomes ragged and thin in the upper posterior portion. Next, the posterior clinoid processes disappear, and finally the dorsum sellæ becomes narrowed and ultimately disappears.

The author believes that in the production of these deformities a part is played by pulsations as well as direct pressure.

Among other conditions discussed by the author as causes of deformity of the sella are meningiomas arising from the olfactory groove, xanthomatosis aneurisms of the circle of Willis, and certain bone diseases such as osteomyelitis.

CHARLES H. HEACOCK, M.D.

Eisenhardt, L. The Diagnosis of Intracranial Tumors by Supravital Technique. Further Studies. *Arch. Neurol. & Psychiat.*, 1932, LVIII, 299.

This is a second contribution by Eisenhardt from Cushing's Clinic on the examination of fresh brain-tumor tissue by the supravital staining technique. The importance of this method as a means of immediate diagnosis has now become so evident that the procedure is practically indispensable in the

neurological clinic. In addition to its value to the surgeon during the operation, the author cites the "peculiar and enlightening appearances of the tumors in supravital preparations as contrasted with fixed or sectioned specimens." In her report of a series of cases, Eisenhardt includes photomicrographs of the tumors prepared by the supravital technique. Many of the latter are compared with photomicrographs of the same tumors prepared by the usual fixation, cutting, and staining technique. The difference is as great as that between a living animal and the work of a second-rate taxidermist.

LEO M. DAVIDOFF, M.D.

Nicaud, P. Uncomplicated Meningeal Spirochæto-sis (La spirochétose méningée pure). *Presse méd.*, Par., 1932, VI, 793.

In 1916, Costa and Troisier described a syndrome characterized by mild meningismus, nasolabial herpes, and irritation of the conjunctiva. The headache, which is constant and often severe, may be occipital or frontal. Stiffness of the neck and Kernig's sign are present in all cases. Photophobia is frequent. The temperature may rise to 104 degrees F., but after from seven to thirteen days it gradually falls to normal. As a rule the general condition remains good. There are no hepatic symptoms.

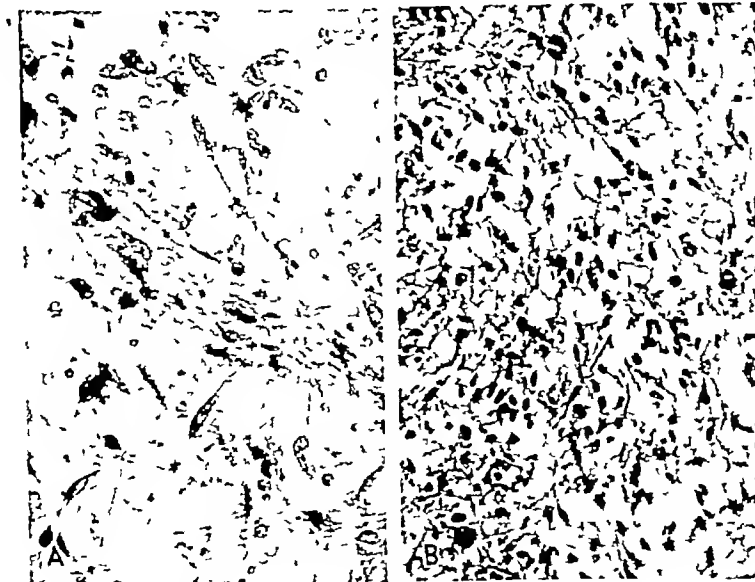


Fig 1

Fig 2

Fig 1. Supravital preparations of spongioblasts. The long wavy processes continue beyond the field.  $\times 300$ .

Fig 2. Zenker fixed preparation of the same tumor (phosphotungstic acid hematoxylin). The cells are shrunken. The arrow points to a unipolar spongioblast for comparison with Fig 1.  $\times 300$ .

(Eisenhardt. *The Diagnosis of Intracranial Tumors by Supravital Technique*)

cardia. A low systolic blood pressure with a weak reduced diastolic blood pressure and a Corrigans pulse were sometimes found. Attention is called to the resemblance of the cardiovascular disturbances to those noted in aortic regurgitation.

4. An arterial bruit of extracranial or intracranial origin was an important sign.

5. The significant X-ray findings consisted of intracerebral calcification and dilatation and tortuosity of the vascular grooves in the bones of the skull. The peculiar character of the calcification found in the venous angiomata was pathognomonic.

Methods of treatment are discussed briefly.

Lao M. Davison, M.D.

Elberg, C. A., and Hare, C. C.: The Blood Supply of the Gliomata: Its Relation to the Tumor Growth and Its Surgical Significance. *Surg. Neurological Trans., New York* 9:2, 11, 12.

On the assumption, abundantly confirmed by pathologists, that tumors may grow either by expansion at the center or proliferation at the periphery, Elberg and Hare undertook this study of the distribution of blood vessels in the gliomata with the hope of determining the characteristics of growth of neoplasms of this type. It seems apparent that the more highly vascularized an area of neoplasm the more active the growth of this area. The authors therefore believe that a demonstration by actual count of the presence of numerous blood vessels at the center and of relatively few blood vessels in the periphery of astrocytomata and medulloblastomata and in the adjacent white matter signifies that these tumors grow by increasing the central portion.

In the glioblastoma multiforme the blood-vessel distribution is quite the opposite as the central area is likely to be necrotic and lacking in vessels while the periphery as well as the adjacent white matter are abundantly vascularized. The authors therefore believe that these tumors expand from the periphery.

Because of these differences, Elberg and Hare conclude that in the surgical approach to tumors of the glioma series it is advisable first to direct the growth in order to gain an idea of the vascularity of the different parts. If the vascularity of the tumor is greatest in the center this part should be removed first whereas in cases of glioblastoma the periphery of the tumor should be especially attacked.

Lao M. D. Davison, M.D.

Dewey, E. M.: Some Features of Glioblastoma Multiforme. *Surg. Neurological Trans. New York* 9:3, 11, 17.

The overgrowth of vascular elements in glioblastoma multiforme was studied at autopsy in ten cases. Large radial sections of the tumor from its center out to, and including normal brain tissue beyond the growth, were obtained. In these radial sections microscopic study revealed five zones. The central zone was always found to be necrotic. Peripheral to this there was a zone showing the

processes of necrosis, phagocytosis, organization, and structural repair. The third zone, the most active tumor tissue, was the area of greatest vascularity and the chief site of blood vessels undergoing hyperplasia. Beyond this there was a transitional zone in which the tissue sometimes changed abruptly to normal brain or showed a considerable zone of granulation and gliosis. It is evident, therefore, that the structure of glioblastoma multiforme may be more orderly than is generally recognized.

The author was able to differentiate four types of blood-vessel alteration in the tumors. Some of the vessels showed an overgrowth of the lining endothelium alone, others, hyperplasia limited to the vessel adventitia or a combination of the two forms, and others, only an extensive fibrosis of the media. These vascular arrangements may occur also, but to a lesser degree, in other forms of tumors. In the endothelial form of overgrowth the endothelial cells themselves appeared to elaborate the heavy reticulin-collagen framework which is characteristic of this type of reaction. The author believes that the necrosis in the tumors was caused as much by the local toxic factors as by the decrease in the blood supply. Large numbers of phagocytic cells were produced by the adventitial tissue of the vessels bordering an area of necrosis. In occasional areas in the tumors a marked increase in fibrous tissue had apparently stratified groups of living tumor cells.

Richard Luzzanna, M.D.

Francinet, H. L.: The Interpretation of Roentgenograms of Pituitary Tumors. *Am. J. Roentgenol.* 1924, 27:74, 897.

As the clinical diagnosis of pituitary tumors is often difficult, the roentgenologist is frequently called upon for aid.

In studying the sella roentgenologically it is important to use a careful, standardized technique. Francinet bases all of his measurements on roentgenograms obtained at a target film distance of 10 in. With this technique he finds that the average depth of the normal sella is from 6 to 7 mm and the vertical measurement is from 7 to 8 mm.

Any deformity of the sella may be evidence of tumor in the cranial cavity. The author groups intracranial tumors according to Korbha's classification as intrasellar, parasellar, perisellar and metastellar.

Intrasellar growth produces atrophy of the dorsum sellae. In the presence of such atrophy the floor becomes thinner and depressed and finally erodes into the sphenoid sinus.

In cases of parasellar tumor the deformity is of the same type as that produced by intrasellar tumors but less marked. Irregular calcification is often present and lies in the solid portion.

In cases of perisellar tumor the deformity is apt to be unilateral and is caused by direct pressure or by the interposed internal carotid artery.

Metastellar tumors obstruct the ventricular system below the third ventricle and produce increased

sensation to pain and high and low degrees of temperature is preserved over a variable area corresponding to the overlap of the radial and musculocutaneous nerves. A chart showing the dissociation of sensation is characteristic and easily distinguished from that of sensation in a partial or recovering lesion.

In incomplete lesions of either the ulnar or the median nerve weak movements of the phalanges of the fingers are, alone, insufficient to indicate whether or not one of these nerves is severed or which one is severed.

Motor recovery follows the course of recovering isolated lesions of the median and ulnar nerve. Sensory recovery follows the same course. A notable observation is the return of sensibility in the area between the sensory supply of the ulnar and median nerve. This is never noted in complete lesions.

HALE HAVEN, M D

### MISCELLANEOUS

Cobb, S., and Wolff, H. G. Muscle Tonus. A Critical Review Based on Work Presented at the International Neurological Congress, Bern, Switzerland, 1931. *Arch. Neurol. & Psychiat.*, 1932, xxviii, 661.

The authors review the discussions on muscle tonus at the last International Neurological Con-

gress with particular reference to co ordination of the ideas there expressed with contemporary literature. They condemn the loose use of the terms "tone" and "tonus" in medical and physiological literature. They are in full accord with recent reports negating the theory of sympathetic innervation of skeletal muscle. On the basis of the facts brought out at the Congress and those already known, they regard it as probable that sympathetic nerves do not end in striated muscle, but that stimulation of the sympathetic nerves to the vessels of a muscle may alter the tissue fluid or blood in such a way as to change the contractility of muscle.

In a brief discussion of cerebellar function with relation to muscular contraction, the authors note that confusion has arisen obviously because the word "tone" has been used to denote anything from mild psychological euphoria to a specific reflex pattern of muscular tension. They believe that in discussions of striated muscle the word "tone" should be replaced by such specific terms as "standing reflex," "postural reflex," and "righting reflex," and that the state of striated muscle at a given moment should be described by such adjectives as "slack" or "taut," or that, better still, the amount of tension should be measured and stated in quantitative terms. They urge that the term "tone" be either discarded or applied only to smooth muscle.

HALE HAVEN, M D

Jaundice is absent. The spinal fluid is under tension but quite clear. The number of cells may increase up to 400 per cubic millimeter. At first, polymorphous leucocytes may predominate but later lymphocytes are more numerous. A search for the spirochetes in the cerebrospinal fluid is always negative.

The diagnosis is made by agglutination tests and inoculation into guinea pigs. The serological diagnosis is definitely positive after the thirteenth day and the agglutination reaches its maximum between the eighteenth and twenty fifth days. The agglutination titer may be as high as 1:100,000. A control ligation test may also be helpful as the patient's serum protects the guinea pig against the effects of blood and urine of another animal dying from experimentally induced spirochetosis. Direct inoculation of the patient's blood or urine into guinea pigs is very seldom positive.

While the highest titer is reached with spirochetes latero-hemorrhagica, other spirochetes may give a slightly positive agglutination test which is later proved to be a group-agglutination.

In the course of the disease a recurrence of symptoms and a secondary rise in the temperature occur not infrequently at about the fifteenth day.

Subjects exposed to contact with rats and those injuring their hands while exposed to decaying animal or vegetable matter may acquire the disease. In the latter group there is enlargement of the epitracheal lymph nodes. A small epidemic of the condition has been observed also among bathers in polluted rivers around Paris.

The prognosis is always favorable. As subcutaneous and intraspinal injections of a specific serum have a remarkable effect on the lentic form of spirochetosis, this treatment might well be applied to the pure meningitic form if it does not subside readily.

OSCAR DE JAKETH, M.D.

### SPINAL CORD AND ITS COVERINGS

Wilson, G.: Remarks on Injury of the Spinal Cord. *Med. Clin. North Am.* 1917, 274, 5.

In the absence of vertebral injury signs of involvement of the spinal cord, even those indicating complete interruption of all of the nervous pathways and a Quenekenstedt test revealing complete block, are not in themselves sufficient to warrant immediate operation. When there is evidence that some of the tracts of the spinal cord are not completely blocked, there is still less reason to operate. Many of the symptoms are due to edema in the spinal cord, which probably has a better chance to subside if the patient is left alone than if he is subjected to a major operation.

If spinal cord symptoms have been produced by a fracture or dislocation of a vertebra it is unlikely that an operation will aid in restoring the function of the cord. However if a small piece of bone is lying within the spinal canal or has pierced the cord, operation should be performed for its removal.

DAVID J. LEWIS, M.D.

### PERIPHERAL NERVES

Pollock, L. J., and Davis, L.: Peripheral Nerve Injuries. Eighth Installation. *Am. J. Surg.* 1917, 274, 499.

In this installment the authors discuss specifically injuries of the ulnar nerve alone and combined injuries of the median and ulnar nerves. The ulnar nerve may be affected in a wide variety of civil injuries. In the war it was involved by from 15.7 to 21.9 per cent of peripheral nerve injuries.

Section of the ulnar nerve should produce inability to flex the proximal or distal phalanges of the ring and little fingers, to abduct or adduct the fingers, to extend the second and distal phalanges of any of the fingers, to adduct the thumb, to contract the flexor carpi ulnaris, and to abduct or oppose the little finger. The ways in which this picture may be altered by supplementary mobility are described. In agreement with Blaslov the authors found that marked sensory loss exists even when the injury has not produced total section of the nerve. The areas of lost and residual supply of the nerve are outlined and shown in illustrations. Clinical manifestations indicating the level of a lesion are described. The authors state that in recovering and partial lesions relatively greater strength in the phalanges is noted, but at times this may be an inaccurate index of the severity of the lesion. Moreover physiological interruption cannot be differentiated from anatomical section by the strength of movements of the phalanges.

The authors found recovery occurring most regularly in the flexor carpi ulnaris and late in the small hand muscles. The abductor of the thumb recovered more frequently than the abductor of the little finger. In many of the cases of ulnar nerve lesions in general there was but little sensory recovery when motor recovery had begun.

The anatomical relationships of the ulnar nerve and its branches are reviewed, and the surgical approaches to the ulnar nerve at all points along its course are described. Details as to methods of transposition to bridge defects and obtain end-to-end and end-to-side anastomosis are given. The authors caution that care must be taken to identify the sections of the roots of the nerve before transposition in order that axial rotation will not occur.

Combined injury of the ulnar and median nerves is common. The varieties of such injuries may be so numerous as to lead to classifications based upon the varied appearance and function of the hand. In total paralysis of both nerves the appearance of the hand is characteristically described as an ape hand. No finger movements are possible except those due to supplementary movements. There is no movement in the little finger and except for extension and abduction of the thumb in the plane of the palm, no movement in the thumb.

The loss of sensation in combined median and ulnar nerve lesions is marked. Tactile sensibility is lost over the area which represents back nerves.

sensation to pain and high and low degrees of temperature is preserved over a variable area corresponding to the overlap of the radial and musculocutaneous nerves. A chart showing the dissociation of sensation is characteristic and easily distinguished from that of sensation in a partial or recovering lesion.

In incomplete lesions of either the ulnar or the median nerve weak movements of the phalanges of the fingers are, alone, insufficient to indicate whether or not one of these nerves is severed or which one is severed.

Motor recovery follows the course of recovering isolated lesions of the median and ulnar nerve. Sensory recovery follows the same course. A notable observation is the return of sensibility in the area between the sensory supply of the ulnar and median nerve. This is never noted in complete lesions.

HALE HAYEN, M D

#### MISCELLANEOUS

Cobb, S., and Wolff, H. G. Muscle Tonus. A Critical Review Based on Work Presented at the International Neurological Congress, Bern, Switzerland, 1931. *Arch Neurol & Psychiat*, 1932, xxviii, 661.

The authors review the discussions on muscle tonus at the last International Neurological Con-

gress with particular reference to co-ordination of the ideas there expressed with contemporary literature. They condemn the loose use of the terms "tone" and "tonus" in medical and physiological literature. They are in full accord with recent reports negating the theory of sympathetic innervation of skeletal muscle. On the basis of the facts brought out at the Congress and those already known, they regard it as probable that sympathetic nerves do not end in striated muscle, but that stimulation of the sympathetic nerves to the vessels of a muscle may alter the tissue fluid or blood in such a way as to change the contractility of muscle.

In a brief discussion of cerebellar function with relation to muscular contraction, the authors note that confusion has arisen obviously because the word "tone" has been used to denote anything from mild psychological euphoria to a specific reflex pattern of muscular tension. They believe that in discussions of striated muscle the word "tone" should be replaced by such specific terms as "standing reflex," "postural reflex," and "righting reflex," and that the state of striated muscle at a given moment should be described by such adjectives as "slack" or "taut," or that, better still, the amount of tension should be measured and stated in quantitative terms. They urge that the term "tone" be either discarded or applied only to smooth muscle.

HALE HAYEN, M D

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The diagnosis is made by agglutination tests and inoculation into guinea pigs. The serological diagnosis is definitely positive after the thirteenth day and the agglutination reaches its maximum between the eighteenth and twenty-fifth days. The agglutination titer may be as high as 1:100,000. A neutralization test may also be helpful as the patient's serum protects the guinea pig against the effects of blood and urine of another animal dying from experimentally induced spirochetosis. Direct inoculation of the patient's blood or urine into guinea pigs is very seldom positive.

While the highest titer is reached with spirochetes tetrahemorrhagica, other spirochetes may give a slightly positive agglutination test which is later interpreted as a group-agglutination.

In the course of the disease a recurrence of symptoms and a secondary rise in the temperature occur not infrequently at about the fifteenth day.

Subjects exposed to contact with rats and those infusing their hands while exposed to decaying animal or vegetable matter may acquire the disease. In the latter group there is enlargement of the epitrochlear lymph nodes. A small epidemic of the condition has been observed also among bathers in polluted rivers around Paris.

The prognosis is always favorable. As subcutaneous and intraspinal injections of a specific serum have a remarkable effect on the icteric form of spirochetosis, this treatment might well be applied to the pure meningeal form if it does not subside readily.

GISEL DE TAKATS, M.D.

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If spinal cord symptoms have been produced by a fracture or dislocation of a vertebra it is unlikely that an operation will aid in restoring the function of the cord. However if a small piece of bone is lying within the spinal canal or has pierced the cord, operation should be performed for its removal.

DAVID J. LEVINSKY, M.D.

#### PERIPHERAL NERVES

Pollock, L. J., and Davis, L.: Peripheral Nerve Injuries. Eighth Issue. *Ann. J. Surg.* 95, April, 990.

In this installment the authors discuss specifically injuries of the ulnar nerve alone and combined injuries of the median and ulnar nerves. The ulnar nerve may be affected in a wide variety of ways. In the war it was involved in from 10 to 18.5 per cent of peripheral nerve injuries.

Section of the ulnar nerve should produce inability to flex the proximal or distal phalanges of the ring and little fingers, to abduct or adduct the fingers, to extend the second and distal phalanges of any of the fingers, to adduct the thumb, to contract the flexor carpi ulnaris, and to abduct or oppose the little finger. The ways in which this picture may be altered by supplementary scotomas are described. In agreement with Blasdel the authors found that marked sensory loss exists even when the injury has not produced total section of the nerve. The areas of isolated and residual supply of the nerve are outlined and shown in illustrations. Clinical manifestations indicating the level of a lesion are described. The authors state that in recovering and partial lesions relatively greater strength in the phalanges is noted, but at times this may be an inaccurate index of the severity of the lesion. Moreover physiological interruption cannot be differentiated from anatomical section by the strength of movements of the phalanges.

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The loss of sensation in combined median and ulnar nerve lesions is marked. Tactile sensibility is lost over the area which represents both nerves,

been advocated. Fat should be eliminated from the diet and carbohydrates given in large quantities. Water should be given freely, and the patient kept as comfortable as possible. ALTON OCHSNER, M.D.

Neuhof, H., and Wessler, H. Putrid Lung Abscess: Its Etiology, Pathology, Clinical Manifestations, Diagnosis, and Treatment. *J Thoracic Surg.*, 1932, 1, 637

The authors summarize the results of a study of lung abscess made at Mount Sinai Hospital, New York. They conclude that putrid abscesses of the lung result from the aspiration of infective particles of material bearing anaerobic bacteria, and that the concept of the disease as merely the sequel of operations on the nose, mouth, or throat, operations performed under inhalation anesthesia, or the known aspiration of foreign material is erroneous. In about one third of their series of cases the abscess occurred in a previously healthy person in whom no predisposing condition could be demonstrated. In the authors' opinion the suppuration is not of embolic origin and is not a complication of pneumonia. In the cases reviewed, certain pathogenic anaerobes were found in every stage of the infection and disappeared when the infection subsided. While there is no absolute evidence that the disease is initiated by these anaerobes, they are the only organisms found in putrid lung abscesses which produce gangrenous lesions of the lungs when introduced into the bronchial tree experimentally.

Putrid abscess of the lung begins characteristically in and distal to one of the smaller bronchi at a site at which the aspirated infective material is presumably arrested. The first stage in its development is an intense necrotizing inflammation of the affected bronchus and its tributary bronchioles. The pulmonary parenchyma supplied by the involved bronchioles soon becomes involved by the severe inflammatory process. Therefore the lesion is always situated near the surface of the lung and a pronounced and early reaction of the overlying pleura occurs. The result is a localized gangrenous abscess superficially situated in the lung and usually of large size. Drainage by way of the bronchus usually begins two weeks after the onset. The course depends largely on the degree of bronchial drainage. In the majority of cases the abscess either remains localized and more or less quiescent for weeks or months with occasional spreads or insidiously involves the adjoining lung in this subacute stage.

The initial symptoms are fever and chilliness or a chill. These are soon followed by pain in the chest, a constant phenomenon which is usually severe and sharply localized. The site of localized pain is identical with the site of pleural adhesions. The pain is associated with circumscribed tenderness. Cough usually begins at the onset of the pain, and at first is unproductive. Expectoration of a foul exudate begins suddenly, usually between the tenth and twelfth days after the onset. In a typical case, expectoration of the pus is followed by subsidence of the fever and

pain. Improvement appears to be progressive for a period of from two to four weeks, and true recovery may result.

During the subacute stage, clubbing of the fingers and toes occurs. There may also be a recurrence of the fetid expectoration and fever, pain in the chest, and roentgen-ray evidence of spread of the infection.

The course of a definitely chronic lung abscess is progressive with extension of the disease to adjacent and distant parts of the lung. If untreated or treated inadequately, the condition is almost invariably fatal. Death usually results within three years of the onset in the cases of adults and in a much shorter time in the great majority of cases.

The diagnosis depends upon a careful consideration of the history and the clinical manifestations. The physical signs are inconstant. Signs of cavitation are rare. The roentgenogram establishes or confirms the diagnosis in the majority of cases. Bronchoscopic examination is indicated in every case of subacute or chronic lung abscess and most cases of acute lung abscess. Bronchography with the use of iodized oil is an invaluable aid in localization of the abscess.

Putrid lung abscess is potentially a surgical lesion from the onset. The principles of the operation performed by the authors are excision of the roof of the abscess and ventilation. The technique is described.

Of twenty patients with acute lung abscess, ten were not operated upon as the clinical course was favorable. All of these ten recovered. One patient died with the acute fulminating type of lesion. Of nine patients who were subjected to operation, spontaneous cure being considered impossible, eight recovered and one died. Of eight patients with subacute lung abscess, six were operated upon. Of the two who were not operated upon, one is now well and the other shows improvement. Of the six who were subjected to operation, three are well and three are dead. All seven patients with subacute lung abscess complicated by acute gangrenous extension died of the condition whether they were operated upon or not. Of thirty-four patients with chronic lung abscesses, thirteen were not operated upon. Of the latter, three show improvement, four show no improvement, and six are dead. Of the twenty who were operated upon, twelve are now well, two show improvement, and seven are dead.

EARL O. LATIMER, M.D.

Ballou, H., Singer, J. J., and Graham, E. A. Bronchiectasis. IV. Treatment. *J Thoracic Surg.*, 1932, 1, 502

In the treatment of bronchiectasis pneumotomy has been more or less discarded. Little can be expected from it except in cases with a single bronchiectatic abscess.

In 1923, Graham proposed pneumectomy performed with the cautery, a method differing at least theoretically from Sauerbruch's lobectomy with the cautery. The conditions most suited to cautery pneumectomy are bronchiectasis with multiple lung



# SURGERY OF THE CHEST

## TRACHEA, LUNGS, AND PLEURA

Macneab, D. B., and Scarlett, E. P.: Traumatic Chylothorax Due to Intrathoracic Rupture of the Thoracic Duct. *Casualties of War* 7: 193 1934, 52.

Chylous effusion into the pleural cavity is rare. In a review of the literature in 1931 Van Nuy's was able to find only sixty-six cases of all types of chylothorax. Only about half of these were associated with severe contusions of the thorax or wounds about the base of the neck. The authors report the thirty-fourth case of chylothorax of traumatic origin to be recorded, the twenty-eighth due to thoracic injury other than a wound, and apparently the third to be recorded in North America. Most of the cases have been reported from Germany and France. The author's patient was a man forty-six years of age who fell a distance of 11 ft., striking his back on a piece of lumber. Six days after the accident he developed a condition resembling shock which was accompanied by dyspnea, sweating, cyanosis, and extreme weakness. Examination revealed dullness of the right chest as high as the clavicle. The following morning the right thoracic cavity was aspirated and 1,750 c. cm. of white fluid tinged with pink were removed. In the afternoon, 2,000 c. cm. of a similar fluid were removed. The patient continued to complain of pain in the right chest which necessitated almost daily aspirations of the chest for relief. In a period of forty-eight days nearly 33 liters of fluid were removed from the pleural cavity. The patient lost weight and suffered from marked anorexia. By thoracotomy 1,000 c. cm. of chyle were evacuated. The patient died approximately two months after the injury. At autopsy the thoracic duct was found exposed throughout its entire length. Near the border of the tenth dorsal vertebra it was ruptured and communicated with the thoracic cavity.

The causes of chylothorax are given by the authors as follows:

### I. Trauma

#### A. External violence

- (1) Closed trauma. No external wound and no fracture.
- (2) Trauma with fracture of the ribs, clavicle, or vertebrae.

#### B. Operative wounds.

- (1) Complete severance of the duct.
- (2) Section of one or more terminals.
- (3) Gunshot wounds.
- (4) Self-inflicted or stab wounds.

2. Newgrowths and granulomata carcinoma, lymphosarcoma, tuberculous glands.
3. Thrombosis of the left subclavian vein.
4. Newgrowths of the duct itself

5. Perforating lymphangioth.
6. Anemia of the duct.
7. Chyloasis of the liver
8. Phlebia.

In the majority of cases of chylothorax the chyle is in the right lower cavity. Of twenty-eight cases reviewed, it was on the right side in fifteen, on the left side in eight, and on both sides in five. Its greater frequency on the right side is probably due to the fact that the lower two-thirds of the thoracic duct are nearer the right side than the left. From the posterior mediastinum the chyle passes into the pleural cavity through the endothelial cells or a hole in the pleura. Characteristically there is a silent period between the time of the accident and the development of cardiac and respiratory embarrassment. In the cases reviewed this period averaged four days. At the end of this period the patient usually developed dyspnea, a rapid thready pulse, cold pallor and signs of shock. The rapid accumulation of the fluid is also striking, sometimes necessitating aspiration twice in a period of twenty-four hours. A progressive loss in weight and marked anorexia occur. The patient fails rapidly and death results from exhaustion and anoxia.

The diagnosis is based on the character of the fluid aspirated. The sudden appearance of shock may be due to anaphylaxis or to sudden disturbances in the pressure relations in the thorax. Pleural fluid of a milky character may be true chyle or pseudochyle. The latter may be due to emulsified fat cells undergoing fatty degeneration. Chylous fluid resists putrefaction and does not coagulate. When it is allowed to stand, a creamy layer of fat forms. The specific gravity is over 1.012. There are many microscopic fat globules which are soluble in ether. The fat content is high, and the fluid accumulates rapidly. In contrast, pseudochylous fluid has a specific gravity under 1.012, and its fat content is low averaging 0.5 per cent. As a rule it shows no microscopic fat and no creamy layer. It collects slowly.

The authors believe that the extreme and rapid loss of weight cannot be accounted for by the loss of chyle. They suggest that it may be due to an intoxication resulting from interference with the lymphatic circulation in the body.

The prognosis of traumatic chylothorax is grave. In thirty cases there were sixteen deaths. The mortality of more than 50 per cent is in contrast to the mortality of 10 per cent in cases of operative injury to the thoracic duct.

The treatment is more or less unsatisfactory. Suture of the duct is impossible. Aspiration of the fluid from the pleural cavity should be done. To decrease the negative pressure, thoracotomy has

examination of expectorated plugs and of the centrifuged pleural fluid. Dyspnea varies according to the type and situation of the tumor. Aphonia or dysphonia often accompanies pulmonary cancer because of paralysis of the recurrent laryngeal nerve. In some cases there may be paralysis of the phrenic nerve which gives a characteristic roentgenographic picture.

As the cancer develops it causes marked constitutional changes with cachexia. Fever of slight degree is generally present, but may be unnoticed until attention is called to it by the development of some acute condition such as pneumonia or grippe, or by suppuration.

The objective signs of primary cancer of the lung are also very diverse. They depend chiefly on the localization and growth of the lesion, whether or not it impinges on a bronchus, whether atelectasis occurs, and whether an associated infection is present. Bronchoscopy and lipiodol studies should be undertaken. A primary cancer developing in the lower lobe is particularly apt to remain silent for a long time. In contrast to tuberculosis and the ordinary inflammatory diseases, the contralateral side usually remains uninvolved. There is no single characteristic roentgen picture. In cases of cancer arising within a bronchus the shadows are difficult to interpret. The tumor itself is invisible and is revealed only indirectly by the associated atelectasis. The intrapulmonary cancer is revealed in typical cases by a rounded shadow, but when such a shadow is seen the disease is probably advanced. A hydatid cyst has a sharper edge and a more homogeneous shadow. In cases of upper lobe cancer, differentiation from tuberculosis may be difficult, but in tuberculosis the shadow is apt to be more circumscribed and its mode of spread is quite different. One of the more important diagnostic signs is paralysis of the phrenic nerve with elevation of the corresponding half of the diaphragm. True paralysis of the diaphragm may be easily differentiated from fixation of the diaphragm due to adhesions and retraction by fluoroscopic examination. If ulceration or necrosis occurs a cavity appears in the roentgenogram.

FRANK B. BERRY, M.D.

Manges, W. F. Primary Carcinoma of the Lung. Roentgen Diagnosis and Preliminary Report on Roentgen Therapy. *Am J Roentgenol*, 1932, xxvii, 858.

Because of the prolonged time between the onset of symptoms and the first roentgen study, primary carcinoma of the lung is usually not diagnosed until there is massive evidence of the disease. There is no single characteristic roentgen sign as the growth varies in location, size, shape, and density. The amount of displacement of organs and the degree of functional interference may be entirely out of proportion to the size of the neoplasm.

In 20 of a series of sixty-one cases studied in the unusually efficient bronchoscopic department of the Jefferson Hospital, Philadelphia, a positive tissue

diagnosis was made only after death. Therefore in one-third of the cases, an antemortem diagnosis depends largely upon the roentgen ray. Of thirty-six cases selected for roentgenographic description, the outline of the tumor was sharp in twenty-three and irregular in thirteen. Twenty-six showed evidence of displacement of the heart and other mediastinal structures toward the side of the lesion, three, displacement toward the side away from the lesion, and seven, practically no displacement. Metastases were evident in six.

Of the patients treated by irradiation, practically all showed at least temporary clinical improvement, and a few of them lived a number of years. One patient has been well, except for bronchiectasis, for seven years. Another has been well for six years, a third has been well for nearly eight years, and a number have been free from symptoms for more than a year. A few of those with advanced lesions showed temporary improvement, but this was followed by rapid progress of the disease.

The author states that it is wrong to try to make a diagnosis of primary carcinoma of the lung without the help of bronchoscopy. He agrees with Clerf that, next to its usefulness in cases of foreign body in the air passages, bronchoscopy has proved of greatest value in the diagnosis of malignancy of the lung.

EDWARD D. CHURCHILL, M.D.

Coonse, G. K., Aufranc, O. E., and Cooper, M. The Importance of Intrapleural Pressures and Their Measurements in Various Pathological Conditions. *New England J Med*, 1932, ccvii, 1.

In experiments on dogs the pressure in both pleural cavities was measured in millimeters of mercury by means of a specially constructed cannula left *in situ*. It was found that under preliminary anesthesia and during inspiration there was a striking increase in the negative intrapleural pressure which was associated with cyanosis and decided changes in the heart rate. The blood pressure was considerably elevated. As the depth of the anesthesia increased, the intrapleural pressure fell. When the respiratory tract was partially obstructed, as by allowing the tongue to fall back into the pharynx, these symptoms were more or less reproduced.

In experiments on dogs in which an attempt was made to cause a condition similar to pneumonia by blocking a bronchus mechanically and introducing fluid or air into the entrapped lobe, it was found that this procedure resulted not only in a greater negative pressure on the obstructed side during inspiration, but also in an increase in positive pressure during expiration. A less marked increase of both negative and positive pressures occurred in the other pleural cavity. The authors conclude that because of the increased negative pressure during inspiration, the mediastinum was forced toward the affected side, and because of the increased positive pressure during expiration, the blood vessels in the involved lung were more compressed. At necropsy the animals so treated showed a condition similar to pneumonia.

abscesses and chronic lung abscesses with secondary bronchiectasis. The method does not seem suitable for cases of probably congenital origin in which there are long, wide dilatations to a lower lobe. In the presence of extensive bilateral lesions it should be used with caution.

Cautery pneumectomy can be made to combine the three cardinal principles of the surgical treatment of pulmonary suppuration—drainage, compression, and extirpation. In the first stage the field is exposed by turning up a flap of skin and muscle and removing two or three ribs for a distance of from 8 to 10 cm. The ribs are removed by subperiosteal resection and the pericostum is peeled from the pleura. Before the operation is continued, the lung must be firmly adherent to the pleura. To determine whether it is adherent, the pleura should be opened. If the lung is not firmly adherent, adhesions may be created by any of the standard methods such as suture and the introduction of gauze packing against the pleura. If the lung becomes retracted away from the pleura during the examination it is best to inflate the lung by positive pressure and then close the pleura and pack gauze against it. After the exposure is made the first stage of the operation may be terminated. In the cases of patients who are poor risks it is not advisable to proceed further.

The first cauterization may be done after about ten days or if the patient is in good condition and firm adhesions are present at the time of the first operation, it may be done at the time of that operation. With a large soldering iron heated to a red heat an excoriation is made into the lung tissue. If an old drainage track is present, it is well to begin by plunging the cautery into the track and working peripherally from there. If the chief lesion is a chronic abscess, the whole abscess cavity may be cauterized away or at least the roof may be removed. In cases in which the chief pathological condition is bronchiectasis, the first objective is to provide multiple drainage openings by exposing a large cross-section of the bronchial tree by burning over a fairly large surface instead of burning too deeply. It is well to wait three weeks before repeating the cauterization. Hemorrhage is controlled by packing.

According to the authors' experience, postoperative hemorrhage does not constitute a serious danger. A greater danger is cerebral embolism, possibly air embolism. It is important to avoid the use of inflammable gases for the induction of anesthesia. The authors prefer nitrous oxide.

In the fifty-four cases of bronchiectasis treated by the authors up to 1930, there were six deaths following the operation, a mortality of 11 per cent. Twelve patients died later but not from the results of the operation. Of the thirty-six patients still alive, thirty-four (94 per cent) have been definitely benefited, one (2.6 per cent) was moderately benefited, and one was not benefited.

Sometimes a chronic abscess persists after cauterization. This may be relieved by a plastic operation

later but frequently it causes so little inconvenience that further surgery is refused.

A large majority of successful lobectomies for bronchiectasis have been performed upon children and young adults. Lobectomy may be a most satisfactory procedure. Good results may be obtained by single-stage or multiple-stage operations, but a single-stage operation is not always feasible. The procedure is still attended by a high operative mortality.

In conclusion the authors state that there is no prophylactic measure which will prevent the development of bronchiectasis with certainty.

EARL C. LATIMER, M.D.

Sargent, R., Mignot, R., Dornand, R., Kourilsky, R., and Benda, R.: The Clinical Forms and Diagnosis of Primary Cancer of the Lung (Formes cliniques et diagnostic du cancer primaire du poumon). *Arch. med.-ch. de l'Ép. 1931*, 63:4, 74, 349.

The authors discuss seven types of primary cancer of the lung: (1) that which begins with pulmonary congestion, (2) that which at first suggests pulmonary tuberculosis, (3) that associated with symptoms of a pleural effusion or a tuberculous pleural abscess, (4) that developing as a pulmonary scleroma, (5) that associated with bronchial stenosis, (6) that associated with bronchopulmonary suppuration, and (7) that with the appearance of an intrapulmonary tumor such as a hydatid cyst or a sarcoma.

Of the twenty-nine patients whose cases are reported by the authors, twenty-seven were males. The histories of the twenty-nine patients suggest that old bronchitis and suppurations play a rôle in the production of pulmonary cancer and its course toward suppuration and gangrene.

The onset of primary cancer of the lung is extremely variable, but is often accompanied by a cough due to pulmonary congestion, the expectoration of necroses or bloody sputum, pain in the side, and fever which is frequently accompanied by chills. After a few days the temperature falls, the cough ceases, and recovery seems about to set in. However, slight fever persists and the general condition gradually deteriorates. Under such conditions tuberculosis should be considered as well as cancer. Frequently cancer of the lung develops very slowly. Sometimes two years elapse from the onset of the first symptom until a definite diagnosis can be made. One of the characteristics of the growth of pulmonary cancer is a tendency toward central localization with cavity formation.

From the subjective standpoint the most important symptom is pain. This is almost constant and always on the side of the tumor. The cough may be either of the ordinary type or paroxysmal. The sputum may have no definite characteristics for some time, but sooner or later hemoptysis occurs. Sometimes a clot or even a piece of tumor is expelled. A diagnosis may be made from histological

# SURGERY OF THE ABDOMEN

## ABDOMINAL WALL AND PERITONEUM

Keynes, G. Prevascular Femoral Hernia *Brit J Surg*, 1932, xx, 55

Unusual forms of femoral hernia are (1) the external, or Hesselbach, hernia, situated external to the deep epigastric artery and associated with an inguinal hernia, (2) hernia through Gimbernat's ligament or Laugier's hernia, (3) pectineal, or Cloquet's, hernia, (4) retrovascular hernia, and (5) prevascular hernia. All of these are rare, and most of them are very rare. However, the prevascular hernia is probably less uncommon than is generally supposed.

The usual theory of the origin of femoral hernia attributes the herniation to the presence of a congenital peritoneal diverticulum on the inner side of the femoral vein. This diverticulum is supposed to be formed by being carried out with the vessels as they grow down into the limb bud of the embryo. As a rule the diverticulum is shallow, but it is increased by intra-abdominal pressure in the line of least resistance—that is, down the femoral canal and into the thigh through the saphenous opening. This is the state of affairs in the vast majority of femoral hernia, the fundus of the sac being in Scarpa's triangle and the neck in the femoral canal. If this theory of the origin of femoral hernia is correct, it may be supposed that occasionally a much longer peritoneal diverticulum is dragged out with the growing vessels and, after accompanying the latter down the thigh, is to be found within the femoral sheath in front of the vessels. The fundus of the hernial sac would then be far below the level of the saphenous opening and would never tend to emerge through it. This would in fact constitute the condition of prevascular femoral hernia.

The author reports a case of the congenital type and a case of the acquired type of prevascular femoral hernia. In the former the fundus is larger than the neck of the hernia, and in the latter the neck is wider than the fundus.

CHARLES F. DuBOIS, M.D.

Reiles. A Case of Chylous Cyst of the Mesentery (A propos d'un cas de kyst chyleux du mésentère) *Bull Soc d'obst et de gynec de Par*, 1932, xxii, 368

Chylous cysts of the mesentery are not common. The author reports the case of a woman of forty-two years who was admitted to the hospital for menorrhagia, pain, and an abdominal tumor. For a year, menstruation had been irregular, recurring at intervals of from three to six weeks and continuing for from eight to ten days. The patient complained of a feeling of weight in the abdomen with severe pain radiating to the lumbar region which became more

severe at night. Palpation revealed a hard, round, movable tumor the size of a fist, in the left subumbilical region. The neoplasm had an irregular surface and was not painful. The diagnosis rested between abdominal and genital tumor.

Laparotomy disclosed a hard, red, irregular tumor the size of two fists, which was surrounded by loops of small intestine. The surrounding mesentery was infiltrated and thickened as by chronic inflammation. During its enucleation, the tumor ruptured and a white, milky, odorless fluid escaped. The neoplasm proved to be a large, unilocular chylous cyst of the mesentery.

Chylous cysts of the mesentery are rarely multilocular. They may develop in any part of the mesentery or mesocolon, but some surgeons have found them most frequently in the region of the ileocecal valve. The clinical symptoms are few and the diagnosis is difficult. Pain may be mild or severe. Dyspepsia, constipation, and distention may develop. In the obstructive type the symptoms may be due to compression of the intestinal loops, occlusion, or volvulus. In the author's case a diagnosis was impossible from the clinical findings.

In the differential diagnosis it is necessary to consider cancer of the intestine, hydatid cyst, encysted tuberculous peritonitis, and genital tumors. In the cases of children, operation performed for suspected mesenteric cyst have frequently disclosed glandular mesenteric tuberculosis.

The course of chylous cysts of the mesentery is usually slow and progressive with occasional periods of exacerbation due to intracystic spontaneous or traumatic hemorrhage, slight attacks of peritonitis, or transitory intestinal obstruction.

Because of the numerous possible complications, such as infection, rupture, intestinal occlusion, and dyspeptic disturbances which may lead to advanced malnutrition, the prognosis is not very favorable. Operation is indicated whenever it is possible. The operation of choice is enucleation of the cyst. Difficulties may be encountered because of extensive vascular or intestinal lesions. In the presence of an anomaly in the location of the vascular arcs, intestinal infarction may occur with all of its grave consequences.

Enucleation is indicated when the cyst is single, not too large, and fairly free from adhesions. For cases of large cysts with extensive adhesions, marsupialization or extirpation with resection of the involved loop of intestine is recommended. This procedure may be followed by a fistula persisting for from four to five months or by a recurrence, but in such case a cure may follow a second operation. Extirpation of the cyst with resection of a portion of the intestine is a serious operation with a fairly high

The authors believe that pneumonia occurs because, as the result of the bronchial obstruction, there is an increased negative pleural pressure which in turn causes an increased negative pressure in the alveolar spaces, distention of the capillary vessels, and transudation of fluid and blood into the capillary spaces. In the experiments reported the introduction of fluid into the pleural cavity resulted in a prompt diminution of the increased negative pressure. On the pneumonic side only small amounts of fluid were necessary (as small as from 50 to 100 c.cm.) Their introduction resulted almost immediately in a decrease in the rapidity of respiration and an increase in the excursion of the chest wall. The animal's color simultaneously improved, and within from ten to twenty minutes, cyanosis and dyspnoea had practically disappeared. The authors believe that the partial obstruction causes the pneumonia rather than that the pneumonia produces the obstruction.

Determinations of intrapleural pressure were made by the authors also in the cases of patients with various pathological conditions. In a case of left-sided lobar pneumonia the changes found were comparable to those occurring in animals. The in-

troduction of 110 c.cm. of normal saline solution into the pleural cavity resulted in prompt clinical improvement. The respiration became less labored and more regular, the cyanosis became greatly relieved, and the pulse improved in volume and quality. As soon as enough time had elapsed for the solution to be absorbed (about half an hour) all of the initial symptoms recurred. Measurements were made also in two cases of pulmonary tuberculosis—one with adhesions (in which the measurements were not satisfactory) and the other with pulmonary hemorrhage. When, in the second case, a liter of fluid was introduced into the pleural cavity, the patient was considerably relieved, the cough diminished, the temperature decreased, and the hemoptysis was controlled. In a case of acute postoperative cardiac failure with a systolic blood pressure of 70 mm. Hg and a diastolic pressure of 30 mm. Hg, 300 c.cm. of sterile olive oil were introduced into the pleural cavity. After this treatment the blood pressure promptly returned to 110 mm. Hg systolic and 78 mm. Hg diastolic, the Cheyne-Stokes respiration ceased, the previously fibrillating heart beat became regular and the general condition became markedly improved. ALTON OOSTROM, M.D.

# SURGERY OF THE ABDOMEN

## ABDOMINAL WALL AND PERITONEUM

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CHARLES F. DuBOIS, M.D.

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mortality. It is indicated in cases of extensive adhesion between the cyst and intestine and in cases with multiple adhesions necessitating the sacrifice of larger mesenteric vessels.

The author reviews the mortality of the various procedures and discusses the theories as to the pathogenesis of the cysts. Klemm and von Rittner concluded that the cysts represent a true process of neoformation. Hlutz believes them to be retention cysts. In the author's case, histological examination showed the cyst to be due to a degenerative cystic process of the lymph glands. **EMER F. MOORE.**

### GASTRO-INTESTINAL TRACT

Fontaine, R.: A Contribution to the Study of Gastric Mucosa (Contribution à l'étude du mucus gastrique). *Presse Méd. Par* 1932, 41, 678.

In a study of the number of the mucous cells in the stomachs of dogs it was found that the fundus contained approximately 12,000,000 and the pylorus 1,500,000 cells.

The use of Mayer's methacarbonyl stain demonstrated a heavy layer of mucus which stained deeply although the mucosa membrane itself stained only very lightly. The amount of mucus on the surface of the mucosa decreased from the fundus to the pylorus. The difference was very marked in the dogs which were killed at the time of digestion and hardly noticeable in fasting dogs. When Hoyer's thionine stain was used the mucus on the surface stained red at the fundus and a definite blue-violet toward the pylorus. This change in staining was dependent upon the hydrogen-ion concentration of the media. When hydrochloric acid was added to the blue-staining pyloric mucus, the color immediately became red, and when the mucus was re-alkalinized the color reverted to its original blue. Differences in acidity may explain why histologists have found such variations in different types of mucus.

The findings seem to warrant the assumption that the fundus is protected against the proteolytic action of the peptic juices better than the pyloric region because of its heavier layer of mucus, particularly as mucus is more readily soluble in the alkaline medium found in the pyloric antrum. This would explain the greater frequency of ulceration in the antropylic region. The author concludes that mucus hinders autodigestion of the stomach by its viscosity and other physical characteristics, and is of great importance in the physiological and pathological processes in the stomach.

**SARIEL J. FOOTLOCK, M.D.**

Thompson, H. L.: Resection of the Pylorus—Its Effect on the Secretory and Motor Functions of the Stomach. *California & New Med.*, 1932, xxvi, 363.

The author calls attention to the fact that in drawing conclusions regarding the normal gastric secretory response to ingested food it is necessary to bear in mind that there are three phases of gastric secre-

tion—the cephalic, the gastric, and the intestinal, that the quantity of food ingested with its acid-combining power is of importance, that the acidity is affected by the reflux of duodenal contents (that there is a difference in response to standard stimulation not only in different persons but also in the same person) and that conclusions based on surgery are unsatisfactory for the interpretation of physiology because in the use of surgery the existence of organic disease of the digestive tract is presupposed.

To control these variables Thompson performed multiple operations (as many as five) on the same animal. The physiological effects of each operation were determined by fractional gastric analysis after the animal recovered and by roentgenological examination carried out before and four weeks after the operation.

The study of the physiological effects of resection of the pylorus was conducted in three phases. In the gastric phase only the gross effect of resection on the acidity and movement of the gastric contents was noted. The method consisted in the performance of multiple graduated resections of the pylorus on the same animal. Resection of Grade 1 consisted of the removal of the distal 2 cm. of the circumference of the pyloric portion of the stomach, including the pyloric sphincter which should alter the emptying time of the stomach and change the acidity of the gastric contents by the admittance of duodenal contents. Further to determine the rôle of the pyloric antrum two more resections were added and the results of the operations compared. In resection of Grade 2 the distal half of the pyloric antrum was resected, and in resection of Grade 3 the remaining half of the antrum with a narrow band of the distal portion of the fundus was removed in order to insure removal of all of the pyloric mucosa. The continuity of the gastro-intestinal tract was usually re-established by a Pylus gastroyejunostomy.

It was found that after resections the acidity of the gastric contents subsequent to the ingestion of the test meal varied indirectly with the amount of pylorus removed. Removal of the pyloric sphincter had practically no effect upon the acidity of the gastric contents. Removal of the distal half of the pyloric antrum slightly reduced the acidity, whereas after removal of the entire pyloric antrum there was a marked reduction of the hydrogen-ion concentration and total acidity, and free acid did not appear. When histamine was used as a gastric stimulant there was no reduction in the acidity regardless of the amount of stomach resected. In order to investigate this apparent discrepancy further Pawlow pouches were formed in the fundus of the pylorotomized stomach in five dogs. These showed that although the acidity of the mixed gastric contents was low free hydrochloric acid being absent, the acidity of the secretion of the fundus pouch was normal, suggesting that the postoperative achylodyria was more apparent than real. When a Billroth I or Billroth II operation was substituted for the Pylus gastroyejunostomy there was no appreciable change in either

the secretory response or the motility. The emptying time decreased with resection of the pyloric sphincter, but further resection had no appreciable effect.

The cephalic phase of this study consisted of bilateral transthoracic vagotomy which eliminated the cephalic effect in three dogs in which the pyloric antrum had been resected. Following this procedure, gastric juice with extremely low acid values was secreted when food was ingested (no mention is made of the effect of histamin on these animals). This observation indicates that following resection of the pyloric antrum the cephalic phase of secretion is of major importance to the secretory activity of the remaining fundus.

When the effect of duodenal reflux was eliminated by the substitution of a Roux jejunostomy for the Pólya operation in dogs in which the pyloric antrum had been resected, only a slight increase in the acidity of the gastric contents was noted, indicating that the duodenal contents which enter the stomach normally or after resection of the pylorus possess a slight buffer value and neutralizing power.

SAMUEL J. FOGELSON, M.D.

Rivers, A. B., and Wilbur, D. L. The Syndromes of Gastro-Ileostomy and Gastro-Ileac Ulcer. *Surg., Gynec. & Obst.*, 1932, lvi, 937.

The general characteristics of the secondary peptic ulcers which occasionally occur about a gastro-jejunal stoma may be duplicated even to certain minute histopathological characteristics by lesions developing subsequent to the formation of an anastomosis between the stomach or the jejunum and the lower part of the ileum.

Clinical evidence suggests that the possibility of the development of peptic lesions arises whenever and wherever any segment of intestinal mucosa is exposed to the eroding action of the gastric chyme.

It appears that a syndrome fairly characteristic of gastro-ileostomy can be formulated. If following an operation performed for a gastric lesion particularly a sidetracking operation the patient begins to have henteric diarrhoea, faecal vomiting and faecal belching and loses weight rapidly despite a normal appetite and the normal ingestion of food, the suspicion should arise that an anastomosis has been made erroneously between the stomach and the ileum or colon, or between the jejunum and the ileum or colon.

If, following a period during which such symptoms have developed, pain is superimposed and if this pain is situated lower than the original pain and occurs from thirty minutes to several hours after meals, if it is referred downward or to the back, and is to any degree relieved by the ingestion of food or the administration of an alkali, the presence of a gastro-ileac ulcer may well be suspected.

Gastro-ileostomy in itself may not produce definite symptoms because in some cases the pylorus remains patent and maintains its physiological function so that most of the food reaches the duodenum

and the small bowel in the normal manner, thus preventing emaciation, dehydration, and henteric stools. The more gastric contents leave the organ through the stoma the more definite the syndrome of gastro-ileostomy will become.

Villardell, J., and Lloret, M. Histological Study of the Liver by Biopsy in Cholecystitis and Gastro-duodenal Ulcer (Estudio histológico del hígado—por biopsia—en las colecistitis y úlcus gastro-duodenal). *Rev. med. de Barcelona*, 1932, ix, 140, 225.

The existence of liver lesions in cholecystitis with or without stones was observed long ago, and sclerosis of the liver near the gall bladder has been considered a sign indicative of cholecystitis. Recently studies of the liver have been made not only near the gall bladder but also at a distance from it. In 1918, Graham extirpated bits of the liver at a distance from the gall bladder in all of his operations for cholecystitis and found lesions of varying intensity. In 1921, in collaboration with Peterman and Priest, he studied the liver in experimental cholecystitis and demonstrated that liver lesions are always present in this condition. The association of liver lesions with gall-bladder disease has been confirmed by Judd, Movnihan, Heyd, Kilhan, MacNeal, Koster, Goldzieher, and Collens. In Spain, Ribas y Ribas has also studied this problem.

It has long been known that patients with gall-bladder disease are very sensitive to anaesthetics, and that a considerable number of them die without apparent cause. These facts were formerly attributed to postoperative insufficiency of the liver, but are doubtless explained by liver lesions that existed before the operation. A further study of this question will probably cause profound changes in surgical technique in gall-bladder disease. The liver lesions are probably responsible for recurrences after cholecystectomy. Many failures in gall-bladder surgery are due, not to lack of skill of the surgeon or defective technique, but to the liver lesions which are not cured by removal of the gall bladder. In the cases of recurrence of symptoms after cholecystectomy which were studied by the authors the inflammation found in the liver by biopsy was severe. Operation should be performed early when the first signs of biliary infection appear, medical and dietetic treatment should be given for a long time after the operation, gall-bladder drainage and antisepsis should be used, and, if possible, drainage of the common duct should be established during the operation.

The authors review seventeen cases of cholecystitis in which they studied the liver by biopsy before operation. They report the clinical and histological findings in detail.

In all of the cases they found interstitial hepatitis localized chiefly in the periportal connective tissue. The liver lesions did not always parallel the gall-bladder disease in severity. There was no apparent difference in the liver lesions in cases with and without stones. In none of the cases did the stones consist entirely of cholesterol. The co-existence of liver



and gall-bladder lesions in all of the cases indicates that there must be an etiological relationship between the two diseases. The fact that liver lesions in cholecystitis may develop into cirrhosis suggests that cirrhosis may be of infectious origin.

Gastrointestinal ulcer is almost always accompanied by liver lesions of an infiltrative parenchymatous and interstitial type and an increase in the size of the perportal spaces. The lesions in duodenal ulcer is due to liver lesions if it is not caused by a mechanical disturbance (intense pediculitis) or cholecystitis.

AMBERT GOS MONROE, M.D.

Cushing, H.: Peptic Ulcers and the Intestines. *Surg. Gynec. & Obst.*, 1931, 51.

Cushing reports eleven cases of intracranial disease accompanied by lesions of the upper gastrointestinal tract. These included four cases of cerebellar tumor, one case of olfactory groove meningioma, two cases of malignant hypernephroma with marked papilliferous, one case of aneurysm of the basilar artery, one case of right parietal metastatic hypernephroma, one case of median cerebellar medulloblastoma, and one case of tumor of the third ventricle. In the first ten cases death occurred after short periods of hyperpyrexia, and autopsy was probably performed soon enough to preclude the possibility of postmortem digestion. The findings varied from acute hemorrhagic erosion of the gastric mucosa and esophageal or gastric perforation to extensive encephalitis or gastric neoplasia. In a case of malignant hypernephroma with marked papilliferous in which death occurred five days after a perforated gastric ulcer had been closed, autopsy revealed an extensive gastronecrosis. In the case of median cerebellar medulloblastoma, which was treated by irradiation over a period of two years, definite pre-operative evidence of a duodenal ulcer was confirmed at autopsy. In the case of tumor of the third ventricle, which has responded excellently to irradiation, subjective symptoms and roentgen findings of duodenal ulcer are present only when the cranial lesion is active.

All of the types of gastro-intestinal disease found in these eleven cases were described by Rokitsansky in articles published in the period from 1841 to 1846. Rokitsansky stated that the probable cause may be looked for in diminished innervation of the stomach due to a morbid condition of the vagus and extreme acidification of the gastric juice. This was the first definite suggestion that an ulcerative process of the upper alimentary tract may be of neurogenic origin.

Although the teachings of Rokitsansky have been superseded by the concepts of Virchow who believed that ulcer is essentially a local process, Rokitsansky's theory that ulcer has a neurogenic basis has gained wider acceptance as our knowledge of the vegetative nervous system and its cerebral connections has increased.

Further confirmatory evidence may be found in the large number of case reports in the literature describing cranial lesions associated with disease of

the upper part of the gastro-intestinal tract. Support for the neurogenic origin of ulcer may be found in the work of Schiff who observed that, in dogs and rabbits, a unilateral cerebral lesion involving the optic thalamus and adjacent cerebral peduncle often led to "softening" of the stomach and occasionally to perforation. These findings were confirmed by Brown-Osgood, Klotz, Kiefer and others, but whether the secondary peptic lesions are due to parasympathetic (vagal) stimulation or a sympathetic paralysis must remain conjectural until more precise information is at hand. However in man, stimulation of the parasympathetic center by intraventricular injections of pilocarpine or pilodrine causes an increase in gastric motility, hypertonia, and hypersecretion leading to retching and the vomiting of vomitus containing occult blood. The same effects, associated with observable patches of hyperemia of the gastric mucosa, have been found by Beattie to follow direct electrical excitation of the tuber cinereum in animals.

It is probable that under normal conditions the parasympathetic apparatus is likewise strongly affected by cortical or psychic influences. As a result there may be a direct stimulation of the tuber or its descending fiber tracts, or what theoretically amounts to the same thing, a functional release of the vagus from paralytic or antagonistic sympathetic fibers, leading to hypersecretion, hyperchlorhydria, hypermotility and hypertonicity which are especially marked in the pyloric segment. Spasmodic contractions of the musculature possibly supplemented by local spasm of the terminal blood vessels produce small areas of ischemia or hemorrhagic infarction, leaving the overlying mucosa exposed to the digestive effects of its own hyperacid juices.

Thus it is possible to retrace the neurogenic theory of ulcerations sponsored by Rokitsansky with Virchow's variously modified theory of a primary local cause, whether the lesions are considered as simple erosions, acute perforations, autodigestive softening or chronic ulcers and whether they involve chiefly the esophagus, the stomach, or the duodenum.

SAMUEL J. FORDSON, M.D.

Gilman, J., and Seint, J. H.: Acute Perforated Peptic Ulcer. A Review of Sixty-Four Cases. *Br. J. Surg.*, 1932, 23, 72.

Sixty-four cases of perforated peptic ulcer operated upon in the period from 1925 to 1930 were reviewed to determine the postoperative fate of the patients. Ninety and seven-tenths per cent of the ulcers were duodenal, 4.3 per cent were pyloric, and 5.7 per cent were gastric. In the fifty-one cases in which operation was done within twelve hours after the perforation there was one death, a mortality of 0.5 per cent, and in the thirteen cases in which operation was performed more than twelve hours after the perforation there were two deaths, a mortality of 15 per cent. The total mortality was therefore 4.7 per cent. In sixty-three of the cases the operative treatment consisted of closure of the per-

foration. In one case, gastro-enterostomy was done in addition to closure of the perforation.

Of the forty-eight patients who could be traced, four had died. The deaths were due respectively to cardiovascular disease, bronchopneumonia, recurrent perforation with fatal peritonitis and an unknown cause. Of the forty-four patients who were still alive, seventeen (38.6 per cent) had a satisfactory result, eleven (25 per cent) a fair result, and sixteen (36.4 per cent) a poor result. By "satisfactory result" is meant a symptomatic cure. As an ulcer may remain silent, absence of symptoms does not necessarily mean that it has healed. The authors therefore avoid the use of the word "cure."

The remote results following simple suture, suture plus gastro-enterostomy, and excision and pyloroplasty are not so good as those following resection. Therefore recurrent ulcers or complications should be treated by partial resection rather than by conservative measures.

SAMUEL J. FOGELSON, M.D.

Pearse, H. E., Jr. Recurrent Perforation of Peptic Ulcers. *Ann Surg*, 1932, xcvi, 192.

Among 4,873 cases of perforated peptic ulcer reported in the literature there were 33 cases of recurrent perforation. The incidence of recurrent perforation was therefore 0.69 per cent. In the cases of recurrent perforation there were 3 deaths, a mortality of 9 per cent. However, as these cases represent a total of 75 acute perforations, the mortality per perforation was 4 per cent.

It appears that when a patient survives acute perforation of an ulcer he is less likely to die from subsequent perforations. This may be explained by (1) the presence of adhesions, which limit the extravasated material to localized pockets and prevent its dissemination in the peritoneal cavity, (2) an increase in the local immunity of the peritoneum resulting from the previous inflammation, or (3) the early institution of treatment due to the fact that, as a result of his previous experience, the patient makes his own diagnosis.

SAMUEL J. FOGELSON, M.D.

Melnick, P. J. Metastasizing Leiomyoma of the Stomach. *Am J Cancer*, 1932, xvi, 890.

Benign mesenchymatous tumors of the stomach are considered rare. Of the various types described, myomata are the most frequent. These tumors occur most often in persons just past middle age. The duration of their symptoms may extend over many years. Hematemesis or melena followed by severe anemia is frequent. A number of patients have bled to death. Pyloric obstruction may occur. A palpable mass may be present. The gastric acidity remains unchanged. Roentgen examination of the stomach is of great aid in the diagnosis, especially if the tumor is intragastric. In recent years some of these tumors have been surgically removed.

The case reported by the author was that of a fifty-year-old laborer with a history of alcoholic

excess who entered the Illinois Research Hospital July 2, 1931. Three months previous to his admission the patient suffered from attacks of dizziness and weakness associated with the passage of tarry stools. X-ray studies were essentially negative. Blood examination revealed a marked anemia, the red cell count being only 450,000 per cubic millimeter.

Three weeks after the first examination the patient appeared at the Cook County Hospital, Chicago, suffering acutely from anemia. He responded rapidly to a blood transfusion and left the hospital against advice. He returned to the same hospital September 5 and died there six days later. The autopsy was performed by Jaffé.

Besides the findings indicative of marked acute anemia, the chief pathological changes were in the stomach. At the cardia, on the greater curvature, there was a firm, coarsely lobular tumor mass about 9 cm. in diameter and 5 cm. high arising from the gastric wall. Near the center of this mass there was a crater-like ulcer 2 cm. wide and 1.5 cm. deep which was filled with coagulated blood. In the right lobe of the liver there was a metastatic node 2 cm. in diameter. On microscopic examination the tumor was found to be composed of long fusiform cells arranged in bundles which interlaced in various directions and were separated by scanty connective tissue and scanty blood vessels. The structure of the metastatic node in the liver resembled the structure of the primary tumor of the stomach wall except that the cells were slightly longer. The anatomical diagnosis was ulcerated leiomyoma of the stomach with metastasis to the liver, severe generalized anemia, eccentric hypertrophy of the heart with fatty degeneration of the myocardium, and chronic splenic tumor.

Cases of myoma of the stomach reported in the literature are reviewed. JOHN W. NUTZ, M.D.

Brandão Filho, A., Ribeiro, E., and De Figueiredo, M. The Role of the Duodenal Juice in Gastric Surgery (Du rôle du suc duodénal en chirurgie gastrique). *Rev. Sud-Am. de méd. et de chir.*, 1932, iii, 297.

In all surgical procedures for peptic ulcer Balducci's theory of duodenal reflux and its importance in reducing gastric acidity must be given consideration. Because of their high buffer capacity it is essential for the pancreatic, biliary, and duodenal secretions to be readily accessible to the ulcer-bearing area. Any surgical procedure which prevents their access to this area is not ideal in the treatment of gastroduodenal ulceration. The high acid values found in cases of peptic ulcer may be due to a decrease in the duodenal reflux (Charles and Bolton) which is probably secondary to hypertonicity of the pyloric sphincter.

Three hundred cubic centimeters of 0.5 per cent hydrochloric acid were introduced into the stomachs of nineteen subjects. In three normal controls the acidity decreased as the stomach emptied, but in

ten patients with ulcer at or near the pylorus it increased. The increase in the latter confirmed the findings of Elman. It was due primarily to inadequate duodenal reflux from pyloric spasm secondary to the ulcer.

To obtain the most satisfactory surgical end-results the ulcer-bearing area should be resected, pyloric spasm eliminated, and duodenal reflux rendered possible. These requirements are met by partial gastrectomy. **BARTLEY J. FOSBROOK, M.D.**

**Kosko, I. I. Acute Intestinal Obstruction at the Lebanon Hospital. *Ann. Surg.* 1935, xcv 21**

The mortality of acute intestinal obstruction varies from approximately 40 to 50 per cent.

In 125 cases reviewed by the author the average mortality was 38.38 per cent. The causes, sex incidence, and mortality in these cases are shown in the following table:

Cause	Males	Females	Total	Males	Females	Percentages Of total admission	Percentages Of total mortality
Strangulation	24	11	35	29	7	28.5	23.5
Adhesions	1	1	2	1	1	1.6	1.6
Intussusception	7	1	8	1	1	6.4	6.4
Secondary ileus	1	1	2	1	1	1.6	1.6
Volvulus	4	1	5	1	1	3.2	3.2
Neoplasms	1	1	2	1	1	1.6	1.6
Hernias	1	1	2	1	1	1.6	1.6
Carcinoma	1	1	2	1	1	1.6	1.6
Lymphosarcoma	1	1	2	1	1	1.6	1.6
Primary tumor	1	1	2	1	1	1.6	1.6
Metastatic	1	1	2	1	1	1.6	1.6
Neurofibroma	1	1	2	1	1	1.6	1.6

Progressive interference with the return flow of the circulation, thrombosis, infarction, edema, and the evolution of a serous or hemorrhagic fluid finally render the gut non-viable or gangrenous. The toxicity of intestinal obstruction is due to the vascular disturbance and the changes dependent thereon.

The diagnosis of intestinal obstruction can be greatly facilitated by roentgenographic examination and gastric lavage. The importance of the visualization of gas in the small intestine as a sign of intestinal obstruction in adults has not received due recognition.

Gastric lavage is of aid in the diagnosis especially when facilities for roentgen examination are not available. The stomach should be washed until the return flow is clear and the washing repeated within an hour. The presence of high intestinal or fecal material in the return flow from the second washing is pathognomonic of intestinal obstruction.

**CHARLES F. DE ROSE, M.D.**

**Ullman, A., and Abelson, B. L. Lymphosarcoma of the Small and Large Intestine. *Ann. Surg.* 1935, xcv 373.**

Ullman and Abelson report a case of lymphosarcoma of the ileum. The tumor was unexpectedly encountered during the course of an operation for the removal of an appendix pre-operatively considered to be subacutely inflamed. The neoplasm was smaller and formed a constricting ring on the

terminal ileum about 25 cm. from the ileocecal valve. In the adjacent mesentery there were 2 abscesses. The tumor mass was resected and the abscesses were drained. The immediate postoperative course was successful, but the patient died six months later of recurrence of the growth.

From a study of the clinical and pathological data in 125 collected cases and the case reported in this article, the authors draw the following conclusions:

1. Lymphosarcoma occurs in the small intestine twice as frequently as in the large intestine. Its most common site is the ileum.

2. The tumor occurs most frequently in the first, third, and fourth decades of life.

3. The disease is not accompanied by a characteristic clinical syndrome. The usual outstanding symptoms are those of obstruction.

4. An annular growth is the most common form. It begins in the lymphoid tissue of the submucosa and spreads laterally through the coats of the intestine.

5. Lymphosarcoma of the intestine is nearly always accompanied by metastases.

6. Prompt radical surgery offers most from the standpoint of curative treatment.

7. Irradiation should be used to prevent recurrence and metastases in operable cases and to control the growth of the tumor and prolong life in inoperable cases. **EARL GARDNER, M.D.**

**Martin, J. J. The Treatment of Ileus. *Ann. Surg.* 1935, xcv 394.**

The high mortality of acute intestinal obstruction has stimulated intensive experimental researches during the last thirty years. One of the most important advances is the recognition of at least three distinct types of dynamic obstruction: (1) simple occlusion without damage to the blood supply or the tissues, (2) strangulation with rapid necrosis, and (3) combinations of these two states.

The evidence of toxicity in simple high obstruction has long been debated. Evidence seems to be increasing that ischemia has little part in the picture. Loss of fluids and salts results from constant vomiting, and death appears to be due to dehydration, demineralization, and starvation. In animals with simple high obstruction and those with a high complete fistula the clinical picture, chemical changes in the blood, and length of survival are strikingly similar. It is generally believed today that death in cases of intestinal obstruction is not due to a specific toxin in the fluid in the obstructed gut. There are many toxins in the products of normal digestion and putrefaction which may be effective.

The pathway of absorption of toxins is indistinct, but many investigators agree that absorption occurs only through the injured mucosa. The importance of increased intra-intestinal pressure is being recognized. This leads to stasis, ischemia, and focal necrosis exposing the vascular bed to the absorption of toxins. The vascular bed of the peritoneum also

readily absorbs toxins of high molecular structure. When distention is prevented, toxæmia usually does not occur and the non-protein nitrogen of the blood remains normal. Emptying a distended loop of toxic material by even the slightest manipulation causes damage to the mucosa, hæmorrhage, and the absorption of toxins. Experimentation on animals and clinical evidence show that stripping of the bowel to empty it of toxic material causes a marked fall in the blood pressure resulting in death or followed by very slow recovery.

In simple obstruction, dehydration, and alkalosis are due to loss of water and acid in vomiting. Blood tests show a progressive diminution in the chlorides, a rise in the non-protein nitrogen, and a high carbon-dioxide combining power. In early simple high obstruction the attempt must be made to maintain the normal sodium chloride level of the blood and relieve the obstruction.

In strangulation, the chief problem is presented by toxæmia. The segment giving rise to the toxæmia must be removed as rapidly as possible. The attempt should be made to get the strangulated segment outside of the peritoneal cavity and restore the normal intestinal current quickly.

Long-continued undrained obstruction constitutes a type of ileus which combines the features of both simple and strangulation obstruction. It is characterized by secretion, distention, capillary engorgement, focal necrosis, and gangrene with ultimate rupture of the viscus and fatal peritonitis. Toxæmia develops rapidly, but dehydration and alkalosis are prominent features. The treatment indicated is the administration of sodium chloride and water and removal of the obstruction with minimal manipulation.

The author reviews 106 clinical cases of all types of ileus which were operated upon by 14 surgeons. In this series there were 30 deaths, a mortality of 28.5 per cent. In 17 of the fatal cases the condition was too advanced for any treatment. In 7 cases of simple obstruction there were 2 deaths, a mortality of 28.5 per cent, in 22 cases of complete strangulation, 11 deaths, a mortality of 50 per cent, in 2 cases of partial strangulation, no deaths, and in 74 cases of combined obstruction and strangulation, 17 deaths, a mortality of 22.9 per cent.

WILLARD J. KISER, M.D.

Schlachetzki, H. The Clinical Picture of Cancer of the Small Intestine (Zum Krankheitsbild des Duenn darmkrebses). *Beitr. z. klin. Chir.*, 1931, clv, 156.

The author states that he was able to find only eighty-eight cases of cancer of the small bowel in the literature and in several of these the tumor belonged to the group of carcinoids which are clinically and histologically distinguishable from carcinoma (Oberndorfer). He reports a case of cancer of the small bowel in a man thirty-seven years of age who had an attack of dysentery during the war and for a year and a half thereafter suffered from

colics in the lower part of the abdomen on the right side which were suggestive of ileus. On the patient's entrance to the hospital he presented the picture of acute ileus. Operation was performed on the assumption that the condition was due to an obstructive band resulting from the dysentery. It revealed at the oral end of a loop of small intestine 30 cm. long a rung-like constricting, egg-shaped tumor which was adherent to the distal bowel. Resection of the loop was followed by side-to-side anastomosis. The patient died seven hours later. Autopsy disclosed extensive adhesions between the colon, omentum, and peritoneum and the presence of bronchopneumonic foci. The tumor was found to be an adenocarcinoma.

Most obstructing carcinomata of the small bowel are situated in the upper jejunum or the lower ileum.

The author concludes from his case that in acute ileus it may be advisable to perform less radical surgery than resection, and that the development of carcinoma of the small bowel may be favored by chronic inflammatory processes. KEMPF (Z)

Walters, W. The Choice of Surgical Procedures for Duodenal Ulcer. *Ann. Surg.*, 1932, xcvi, 258.

Portions of the stomach and duodenum resected for duodenal ulceration in some of the German surgical clinics are contrasted with portions removed at the Mayo Clinic. In the lesions removed at the German surgical clinics marked associated gastritis was found. These gastric lesions are for the most part ulcerative in type and are confined to the antrum of the stomach. They may be associated or not with hæmorrhagic gastritis and hypertrophy or atrophy of the mucous membrane. Konjetzny has found gastritis to be an accompaniment of duodenal ulcer in practically all such resected specimens. In a study of the antrum of the stomach in cases of duodenal ulcer in which operation was performed at the Mayo Clinic associated gastritis was found very infrequently.

It is evident, therefore, that the lesions in Germany and the United States differ not only pathologically but also biologically. Hence the surgical procedures indicated in one group of cases may not be indicated in the other. It is probable that the gastritis associated with duodenal ulcer in Germany accounts for the higher incidence of recurrence of ulceration following the conservative operations of gastro-enterostomy and pyloroplasty in that country in contrast to the low incidence of such recurrence in the United States. It seems possible that the development of recurring ulcer in the few cases (approximately 2.5 per cent) in which it is seen after gastro-enterostomy and pyloroplasty in the United States may be explained by associated inflammatory changes in the stomach in those cases. This small incidence of recurrence might be prevented if such cases were distinguished from those in which no ulcerative gastritis co-exists. In two of the cases at the Mayo Clinic associated ulcerating lesions of the

ten patients with ulcer at or near the pylorus it increased. The increase in the latter confirmed the findings of Elman. It was due primarily to inadequate duodenal reflux from pyloric spasm secondary to the ulcer.

To obtain the most satisfactory surgical end results the ulcer-bearing area should be resected, pyloric spasm eliminated, and duodenal reflux reduced possible. These requirements are met by partial gastrectomy. *Samuel J. Foxworth, M.D.*

Koskin, I. I.: Acute Intestinal Obstruction at the Leiden Hospital. *Ann Surg* 1933 xcv 83.

The mortality of acute intestinal obstruction varies from approximately 40 to 90 per cent.

In 185 cases reviewed by the author the average mortality was 38.38 per cent. The causes, sex incidence, and mortality in these cases are shown in the following table.

Cause	Open		Total	Duesen		Perforation	
	Males	Females		Males	Females	Of small intestine	Of large intestine
Adhesions	44	12	56	20	7	27	3
Diverticulum	3	1	4	3	1	4	1
Malrotation	1	1	2	1	1	2	1
Intussusception	1	1	2	1	1	2	1
Strangulation	1	1	2	1	1	2	1
Malrotation	1	1	2	1	1	2	1
Strangulation	1	1	2	1	1	2	1
Malrotation	1	1	2	1	1	2	1
Strangulation	1	1	2	1	1	2	1
Malrotation	1	1	2	1	1	2	1
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Malrotation	1	1	2	1	1	2	1
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Malrotation	1	1	2	1	1	2	1
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Malrotation	1	1	2	1	1	2	1
Strangulation	1	1	2	1	1	2	1
Malrotation	1	1	2	1	1	2	1
Strangulation	1	1	2	1	1	2	1
Malrotation	1	1	2	1	1	2	1
Strangulation							

ascending, transverse, and descending colons were found to be normal in appearance and caliber. A voluminous fecaloma occupied the sigmoid loop and the high rectum. The intestinal walls were infiltrated and the mesentery was thickened, oedematous, and full of glandular masses. The loop was resected and the continuity of the intestine restored by end-to-end suture.

The left iliac anus was closed on October 31 and the right iliac anus on December 9 by the intraperitoneal procedure. On December 12 the intestine functioned normally.

The authors distinguish three types of megacolon:

1. Complete megacolon without dolichocolon. This is rare, if it occurs at all.

2. Complete megacolon with dolichocolon, generally of the sigmoid, of which the case reported in this article was an example.

3. Segmental megacolon, most frequently occurring in the sigmoid. This is the most common form.

For cases of the first type, Fevre and Follhasson advocate a right iliac colostomy. In those of the second type they supplement a right iliac colostomy by resection of the sigmoid loop. They prefer immediate resection followed by partial suture by Volkmann's method and secondary closure of the intestinal fistula. They believe that forced anal and valvular dilatation is insufficient. In cases of the third type the only efficacious treatment is resection of the sigmoid loop, preferably in two stages.

OKENCZYK, who read this report to the Society, stated that he had observed true rectosigmoid megacolon complicated by secondary megacolon of the rest of the large intestine. He believes this is frequent, if not the rule. He agreed with Fevre and Follhasson regarding the treatment. PAGE.

Kadrnka, S., and Sarasin, R. A Rapid Method for Roentgenological Exploration of the Appendix (Un procédé rapide d'exploration radiologique de l'appendice) *Presse méd.*, Par., 1932, vi, 990.

In the X-ray study of the gastro-intestinal tract in the cases of 1,000 patients, the authors found the appendix visible in 349 (34.9 per cent).

The technique described by them has been used since 1920 and is especially adapted for examination of the cæcum and appendix.

A purge of castor oil is given unless contraindicated, and the large bowel emptied by a simple cleansing enema. The time for the administration of the castor oil is so chosen that the kinetic action on the proximal large bowel will not be exhausted when the opaque enema is administered. If it is desired to show the details of the cæcal mucosa, barium or umbrathor enemas are used, otherwise, the base of the enema is colloidal thorium. The cleansing enema is given one hour before the administration of the opaque enema.

In the first stage of the examination the opaque enema is administered to the patient in the Trendelenburg position. Overdistention is avoided by radioscopic control as it would render the cæcum

incapable of contracting strongly and thereby seriously interfere with filling of the appendix. The cæcum is completely filled by palpation. Occasionally the appendix becomes visible in the first stage of the examination, but as a rule it does not.

In the second stage of the examination the opaque enema is evacuated by natural efforts. This is the stage in which the appendix usually becomes visible as it fills during the efforts at evacuation or, being already filled but obscured by the large bowel, it becomes visible when the enema is evacuated. The point of pain in the region of the cæcum and appendix may be definitely localized by palpation under the screen. The mobility of the ileocecal region may also be determined.

In the third stage of the examination the bowel is insufflated with air under radioscopic control with the patient in left lateral decubitus. The appendix and ileocecal region become visible and adhesions are quite clearly demonstrated. Often the appendix fills in this stage when it has been poorly filled in the preceding stages.

This procedure was used in the cases of 90 patients with ileocecal complaints. The appendix was visible in 66 (73.3 per cent). Of the 24 cases in which it was visible, operation was performed in 16. It revealed fibrosis, periaependicitis, recurrent appendicitis, phlegmonous appendicitis, or periappendicular abscess in 9, chronic appendicitis in 1, obliteration of the lumen of the appendix in 3, fecal stasis in 2, and a fecolith in 1. JAMES B. MASON, M.D.

Muller, G. P. The Mortality of Acute Appendicitis. *New England J. Med.*, 1932, ccvii, 355.

In discussing the mortality of acute appendicitis Muller calls attention to the fact that the Metropolitan Life Insurance Company has noted an increase in the incidence and death rate of the condition. He considers early diagnosis and prompt operation to be the most important factors in their reduction. The age of the patient, the duration of the disease, the influence of laxatives, and the surgical technique invariably affect the mortality of operation. In 585 cases of acute appendicitis the mortality was 2.2 per cent, but in the cases of patients under ten years of age it was 3.3 per cent and in those of patients over fifty years of age it was 6.9 per cent. According to Bower, the mortality is in direct proportion to the duration of the disease. In Muller's series of cases there were no deaths among the patients who had not taken a laxative. In the cases with peritonitis and abscess the ratio of patients who had taken a laxative to those who had not was 5:1, whereas in the cases of simple acute appendicitis this ratio was 2:1. The predominant factor in the mortality was diffuse peritonitis.

Muller believes that every case of acute appendicitis should be operated upon at once if the general condition demands it. As a rule he operates under gas anesthesia with local infiltration. Almost without exception he uses the McBurney incision. In cases of abscess he employs drains and frequently he

stomach were known to be present. In one case they were demonstrated roentgenologically and in the other there was palpable evidence of thickening and congestion in the lower end of the stomach. In support of the theory that pathological lesions vary in different geographical regions, attention is directed to the variability in the incidence of toxic gaster, urinary calculi, and postoperative pulmonary emboli in different parts of the world.

Shillert, E. L. Tumors of the Duodenum and Hypertrophied Gastric Mucosa Protruding Through the Pyloric Canal into the Duodenum. Case Reports, with a Review of the Literature. *Radiology* 93, 114, 79.

Tumors of the duodenum and protruding tumors of the stomach are rare. Thirty-two cases of benign tumor and four cases of sarcoma of the duodenum have been reported in the literature. The symptoms of duodenal tumor are not characteristic. They include pain, vomiting, and indigestion. Those of sarcoma consist frequently of colicky pain, copious vomiting, and a palpable tumor mass. Loss of weight, anemia, and cachexia occur later.

Hypertrophied gastric mucosa with polyp formation is not so clearly understood. It is apparently the end-result of infection in the gastric wall. A polyp of this type may become pediculated and pass beyond the pylorus, or a portion of the hypertrophied gastric mucosa forced by peristalsis may protrude into the lumen of the duodenum. The ball-valve action may produce intermittent symptoms. If there is an associated ulcer, hemorrhage will occur and blood will appear in the stools.

In cases of duodenal tumor X-ray examination is important. It reveals hypermotility of the stomach and a central radiolucent filling defect with no deformity of the contour of the bulb. As a rule gastric residues is not seen. It is generally impossible to differentiate the type of duodenal tumor present. In cases of protruding gastric tumor the ultimate defect will depend upon the length of the pedicle of the neoplasm. If the tumor returns to the stomach the filling defect will be in the stomach at one examination and in the duodenum at another. Protruding hypertrophied gastric mucosa may present a filling defect in the antrum as well as in the bulb. In these cases there is a six-hour residue, the size of which depends upon the amount of obstruction.

WILLIAM J. PERRY, M.D.

Tixier, L., and Clavel, C. H. Emergency Jejunostomy for Severe Gastric Hemorrhage (La Mésostomie d'urgence dans certaines gastrocristes très graves). *Arch. franc.-belges d'chir.* 93 93 1931, 2.

An emergency jejunostomy may be a life-saving procedure. It is indicated in cryptogenic hemorrhage occurring without ulcer which may be secondary to disease of the spleen or liver in cases of postoperative hemorrhage which continues despite surgery on the stomach or duodenum in cases of

hemorrhage in young persons which, despite medical treatment and blood transfusion, has continued until the blood pressure is about 90/50, the hemoglobin 30 per cent, and the red cell count 1,000,000, and in cases in which because of the anatomical findings at operation and the encephalinated condition of the patient it is either impossible or is advisable to attack the ulcer directly. The jejunostomy may be performed under local anesthesia with practically no operative shock, and has the advantage that the patient may be fed immediately afterward.

STUART J. FOULKE, M.D.

Pévre and Follmann: Complete Megacolon in a Child of Four Years. Repeated Attacks of Intestinal Obstruction. Formation of a Right Iliac Mass Followed by Rupture of the Sigmoid Colon. Recovery (Mégacolon total chez un enfant de quatre ans. Crises d'obstruction intestinale répétées. Anse iléocecale droite suivie de rupture du colon sigmoïdienne. Guérison). *Bull. d'Anat. Nat.* 1931, 103 104, 1931.

The case reported was that of a boy four and a half years old who entered the hospital February 2, 1930, with the diagnosis of acute intestinal obstruction. The child had had intestinal disturbances since birth. The meconium was not expelled until the third day and intestinal evacuations were very difficult. The first attack of obstruction, which occurred at the age of seven months, yielded spontaneously.

On examination, the abdomen was found to be distended and the base of the thorax widened. Peristaltic waves could be seen under the abdominal wall. By percussion it was possible to make out areas of tympany and areas of dullness. Numerous localizations could be palpated. The ampulla was empty. In its upper part there seemed to be an abnormally developed valve of mucosa. When Pévre turned the child around with his finger he provoked an abundant elimination of feces and gas which was followed by immediate relief.

Roentgen examination showed an enormous accumulation of gas which masked the hepatic and cardiac shadows. A barium enema revealed megacolon and an enormous dilatation of the left and right colon.

The first operation, a right iliac colostomy on the ascending colon, was performed February 7, 1930. After this procedure the signs of obstruction disappeared, but voluminous localizations persisted in the hypogastrium and the left iliac fossa. On February 24, the anus was dilated and an effort made to reach the valve felt on palpation. No valve was found, but the fecal mass pushed before it the protruded rectosigmoidal mucosa. On February 26, roentgen examination showed the colon to be considerably reduced in size, but disclosed a marked sigmoidal dolichocolon, the sigmoid loop going up quite high in front of the descending colon. Gradually the localizations were again produced in the sigmoid loop.

At the third operation, which was performed July 15, 1930, having been delayed by measles, the

present for years before the involvement of the pelvic muscles allows prolapse of the second degree. The predisposing cause of prolapse is a congenitally long mesocolon with abnormal mobility of the fixed areas. The precipitating causes include such conditions as stricture, neoplasms, colitis, proctitis, hæmorrhoids, impairment of the sphincter, wasting diseases, and polyp.

Prolapse of the first degree can be diagnosed only by proctoscopic examination with visualization of the portion of bowel inverted into the rectum. Persons with this condition usually complain of pain in the back, which is aggravated by cathartics, and of constipation.

The mucous or partial collapse occurring in children tends to correct itself because the child's colon, which normally is disproportionately long, becomes relatively shorter as the child grows.

The primary treatment of rectal prolapse consists in elevating the colon until the rectum is taut and then fixing it in position. This is done through a left rectus incision extending from the pubes to the umbilicus. The colon is usually fixed to the psoas minor. An incision is made through the retroperitoneum to expose the fascia of the muscle. Interrupted sutures of chromicized catgut are made through the longitudinal band of the colon. All of the sutures are introduced before any of them are tied. Only exceptionally is it necessary to use an adjunct procedure such as plastic anal repair or posterior colporrhaphy.

ALTON OCHSNER, M.D.

### LIVER, GALL BLADDER, PANCREAS, AND SPLEEN

Lahey, F. H. The Present Management of Biliary Tract Disease. *Surg. Clin. North Am.*, 1932, **21**, 549.

Most of the mistakes in cases of gall-bladder disease are made as the result of procrastination. The mortality of gall stones is in reality the mortality of a liver condition. The tendency of surgeons has been to wait for repeated gall-stone colics before operating. Therefore biliary surgery is performed upon end-stage pathological changes. The author believes that the diagnosis should be based on less symptomatic evidence than is generally regarded as necessary at the present time. Cholecystitis as well as gall stones is frequently manifested atypically. Patients with digestive symptoms without typical gall-stone colic should not be told that surgery is not indicated.

Even when gall stones do not produce urgent symptoms they should be removed when they are discovered, as surgery later in life may be unduly hazardous.

The Graham test has proved a valuable procedure, but is subject to error, particularly in the presence of an acute duodenal ulcer, colitis, and pregnancy. If the test is uncertain when it is made by mouth it should be repeated intravenously unless the patient has a serious heart lesion or jaundice or is in poor

condition. A subacute cholecystitis may be rendered acute by the intravenous injection of the dye.

Duodenal drainage is a diagnostic procedure of value. When bile pigment and cholesterol crystals are both present, stones will be found in over 95 per cent of the cases. Positive findings are of great value, but negative findings do not exclude stones.

Operation may be delayed longer in acute cholecystitis than in acute appendicitis as the gall bladder is easily walled off by adjacent structures and general peritonitis follows gall-bladder perforation only infrequently. Therefore if the temperature tends to fall the tenderness tends to become localized the spasm tends to disappear, and the general reaction continues favorable, immediate surgery is not necessary, but if after two, three, or four days the clinical signs increase, preliminary drainage should be done and cholecystectomy should be performed about two months later.

Stones may occur in the common duct without definite evidence of their presence. Previous to 1926, the author encountered stones in the common duct in only 8 per cent of his operative cases, whereas today he finds them in 19 per cent. The increase is due to the fact that as it is now known that stones may be non-palpable and may occur in the absence of jaundice and even in the absence of thickening and dilatation of the common duct, the common duct is now explored in 38 per cent of cases in which an operation is performed for gall stones. It is extremely important to remove all stones from the common duct at the first operation as the mortality in cases re-operated upon is 10 per cent whereas the mortality of primary cholecystectomy with exploration of the common duct is only 2.2 per cent.

Choledochotomy is performed by the author in the cases of all patients who have been jaundiced, or have a contracted and thickened gall bladder, a dilated common duct, or a thickened head of the pancreas, and those in whom the cystic duct is wide and patent although the gall-bladder stones are small.

In cases of painless jaundice Courvoisier's law has been of value. This law is not infrequently wrong, but if the gall bladder is relatively normal and the cystic duct is patent, gradual progressive narrowing of the duct will produce obstruction and a positive Courvoisier sign, i.e., a palpable gall bladder. If in addition, the stools continue to be acholic and the painless jaundice increases, cholecystenterostomy is warranted.

Catarrhal jaundice is essentially an infectious jaundice involving the liver cells. Therefore, even when it has been present for only a few weeks, surgical intervention can be of little aid.

A jaundiced patient should be carefully prepared for operation by a diet with a high carbohydrate content and by the administration of large amounts of fluids, salt, and glucose solutions. Calcium is rarely used pre-operatively. Patients with an abnormal sedimentation rate are given transfusions of whole blood. As a rule spinal anesthesia is the anesthesia of choice if it is induced by an experienced



aspiration. In cases of diffuse peritonitis he always removes the appendix. He states that drainage may be considered to have only a local importance. It is usually not necessary for simple turbid fluid, and is never necessary in the presence of an acute condition of the appendix, even if the appendix is gangrenous. If there is no spreading infection. Mather never removes a tube at the end of five days. After operation his patients are given an abundance of water by one of the usual methods. Morphine is administered liberally. Purpethes are never administered until at least a week after the operation and are never given while drains are in place. When covered gauze drains are used they are removed about the fifth day and the next day gentle irrigation and gradual shortening of the tubes are begun. The wound is drenched liberally with one of the newer antiseptics.

#### ESCHMANN CRAMTON

Godard, H., and Pélissier, C.: Intestinal Occlusions in Appendicitis. Primary Occlusions. Postoperative Occlusions. Causes and Treatment (L'occlusion intestinale dans l'appendicite. Les occlusions primitives. Les occlusions post-operatoires. Essai sur les causes et le traitement). *Arch. franc.-belg.* de med. 193 193 1931, 40

From the clinical point of view primary intestinal occlusions may be divided into the following groups: (1) those contemporaneous with the attack; (2) those occurring months or years after the attack; and (3) those occurring in the course of appendicular abscess.

Appendicitis of the occlusive form from the beginning is characterized by association of the syndrome of occlusion with signs of peritoneal infection, constriction fever and leucocytosis. The occlusion is predominant in the clinical picture. The iliac signs on the right side are often slight and anastomosis are masked by the crisis of intestinal peritonitis, the most striking manifestation of which is subperitoneal creeping of the intestinal loops. The latter sign is most important, but in some cases of acute appendicitis with associated paralytic ileus it may be absent.

The lesions observed in the course of operation in cases of primary intestinal occlusion vary widely. They include knots around the small intestine and adhesions to the ileum. Pelvic appendicitis is perhaps frequently the cause of primary occlusions because of adhesions to the tube, the ovary or the sigmoid loop. The authors include with occlusions in appendicitis those observed in acute diverticulitis.

Different varieties of retrocecal, mesocecal, and pelvic abscesses may give rise to mechanical occlusions. Pelvic abscesses are responsible most frequently. As soon as the abscess is evacuated, recovery usually occurs without incident.

Late occlusions may be preceded by dyspeptic disturbances or intermittent painful crises, but as a rule they occur suddenly and the cause is a band which binds the ileum or forms an inextensible collar in which a loop of intestine is strangled.

At operation it is necessary to bear in mind the possibility of multiple bands and the importance of

exploring the terminal portion of the small intestine over a considerable extent and noting the changes in caliber of the small intestine.

In early postoperative occlusions the chief cause is fibrinous adhesions. The formation of such adhesions is favored by ordinary drains, tents, and Mather's drains, contact of the intestine with silk which has been palated with iodine or with very rough operative fields, prolonged exposure of the intestine to air and edematization of the peritoneum.

Among the substances used in medical treatment are paraldehyde, nicotine, atropin, preserved bile, acetyl choline, hyposphoric, and phenolphthalein. Spinal anesthesia also has a stimulating action on intestinal contractility.

When the patient is still in good condition the induction of spinal anesthesia seems to be the ideal method to render the abdomen quiet. In early occlusions following operation for acute appendicitis the Jager's incision is satisfactory because of the ease with which it can be extended upward or downward. In occlusions of convalescence and late occlusions it is preferable to use the technique generally employed in all occlusions seen at the beginning, i.e., to make a direct search for the obstruction through a median laparotomy incision. Nef's primary enterostomy has been almost completely abandoned.

Secondary enterostomy may render great service when the intestine remains distended after removal of the obstruction. Fixation should be done only when absolutely necessary. In some cases of extensive adhesions which cannot be liberated, lateral division by enterostomostomy has been done with success. High jejunostomy has proved successful when other treatment would probably have failed. Lymphaticostomy has been recommended by some surgeons and has been the subject of clinical and experimental research. However it seems that drainage of the thoracic canal in the left cervical region has not come up to expectations.

PAGE

Martin, E. G.: Prolapse of the Rectum: Its Re-classification and Surgical Treatment. *J. Am. M. Ass.* 1931 1931, 264.

The author reclassifies prolapse of the rectum as follows:

1. First degree. Internal or concealed prolapse. Invagination of the (sigmoid) pelvic colon into the rectum. Piles of the pelvic colon.
2. Second degree. Protrusion of the rectum through the anus. Perianal sulcus present. Anus not involved.
3. Third degree. Prolapse of colon, rectum, and anus. No perianal sulcus. Complete anorectal prolapse. Prolapsitis.
4. Partial or anorectal prolapse. Commonly seen in children.

The pelvic colon may extend into the rectum and complete prolapsitis may occur only when the mesenteric attachments of the sigmoid become loosened and elongated. Prolapse of the first degree may be

tion by the diaphragmatic opening and explains the occurrence of hæmatemesis

At a later stage the symptoms resembled more those of intestinal obstruction. The patient complained of sensations of pressure in the upper abdomen which were accompanied by colicky pains, eructations, and sometimes hæmatemesis. In such crises there was great prostration and sometimes dissociation causing continual restlessness and clutching at the upper abdomen, bending over, and pressing with both arms. Such crises ended with gurgling sensations at the base of the left thorax. These symptoms are explained by the inclusion of the splenic flexure of the colon in the herniated parts. In such crises the symptoms were not modified by changes in posture.

An important diagnostic sign is the production of a cough and pain typical of irritation of the left phrenic area when the patient rests on the left side. This usually denotes the presence of an inflammatory process with subdiaphragmatic adhesions.

In the absence of a pleural, bronchial, or lung cavity which can be emptied by abundant expectoration or vomiting, the presence of a phantom tumor at the left pulmonary base is almost pathognomonic of hernia or eventration of the diaphragm. Involvement of the stomach may be determined by percussing the limits of tympany when the patient is seated and then noting the substitution of tympany by dullness when sufficient liquid is ingested. When the colon is involved, similar observations may be made by administering an enema.

In the case reported typical roentgen signs were also observed. The stomach and colon were visualized in the left thoracic cavity, while the left half of the diaphragm could not be made out. When barium was ingested the lower pouch of the stomach was seen before the upper pouch, which was in contrast to the sequence in hourglass stomach due to organic stricture of the walls. Folds of gastric mucosa could be identified in both portions.

After an opaque enema there was absence of filling of the transverse colon. Later there was filling due to antiperistalsis.

The patient was operated upon by Chutro who employed the transthoracic route. The herniated parts were reduced and the defect of the diaphragm was closed successfully. Convalescence was uneventful and recovery complete.

WILLIAM R. MEEKER, M.D.

Ishikawa, N. Local Anæsthesia in Surgery of the Abdominal Viscera, and Especially the Question of the Pain Sensibility of the Abdominal Organs. Vagosympathetic Anæsthesia and Anæsthesia of the Plexus (De l'anesthésie locale dans la chirurgie des viscères abdominaux et plus spécialement de la question de la sensibilité à la douleur des organes abdominaux. L'anesthésie vago-sympathique et de l'anesthésie des plexus) *J de chir*, 1932, xxxix, 809.

For several years the author has performed laparotomies under intraperitoneal diffusion anæsthesia

in order to avoid the principal disadvantages of splanchnic anæsthesia, namely, the pain felt when the left lobe of the liver is raised or the stomach is displaced. At first he used novocain, but he now employs percain. He infiltrates the painful area directly.

Neumann's index of pain sensibility to mechanical stimulation of the abdominal viscera is cited. Ishikawa undertook a clinical, physiological, and pharmacological investigation of the sensibility of the abdominal viscera to pain and the choice of anæsthesia. His clinical investigations consisted of (1) a comparison of the pain symptoms and of the localization and severity of the pain with the pathological state of the viscera as revealed at operation, and (2) a study of the sensibility to pain during interventions on the abdominal organs performed under local anæsthesia.

From his findings he draws the following conclusions:

1. According to their degree of pain sensibility to mechanical stimuli, the abdominal viscera may be classified as follows: (a) parietal peritoneum, (b) anterior gastric plexus, left gastric veins and arteries, and pancreatic tissue, (c) superior and inferior mesenteric plexus and vessels, (d) nerve plexus and vessels of the common, cystic, and hepatic ducts, (e) vessels of the pylorus and lesser curvature of the stomach, (f) colic branch of the renal plexus, (g) hæmorrhoidal plexus, (h) bladder, (i) renal plexus and vessels, (j) uterus, (k) greater curvature of the stomach, and (l) walls of the stomach.

2. Splanchnic anæsthesia is not sufficient for complete insensibility of the stomach. By block anæsthesia or resection of the pneumogastric nerves, especially the left nerve and the splanchnic, complete anæsthesia of the stomach may be obtained. Mechanical stimulation of the pneumogastric produced by manipulation causes a fall in the blood pressure, while stimulation of the sympathetic produces a rise in the blood pressure.

3. The fibers of the abdominal viscera which are sensible to pain are primarily the large myelinated fibers which probably form part of the nerves of cerebrospinal origin.

4. Painless operation on the stomach or biliary tract is possible under vasosymphathetic (vago-splanchnic) diffusion anæsthesia. An injection of pantopon or pavinal and atropin is recommended.

5. For interventions on the small intestine anæsthesia of the plexus at the root of the mesenteric vessels is satisfactory.

6. In appendicitis, a painless operation may be performed only under anæsthesia of the perivascular plexus along the appendicular artery. In the presence of abscess or multiple adhesions, diffusion anæsthesia becomes necessary.

7. Ileocecal resections or resections of the large intestine should be done under anæsthesia of the plexus along the corresponding mesenteric vessels. For the descending colon and the sigmoid, diffusion anæsthesia of the pelvic cavity induced with percain

anesthetist. However, it should never be used for patients who are poor risks, elderly patients, or patients in shock. For the latter regional anesthesia and ethylene are preferable.

STANLEY H. MORTON, M.D.

Boccardo, F.: A Congenital Solitary Adenoma of the Liver (*L'adenoma solitario congenito del fegato*). *Arch. Ital. di chir.* 1925, 2202, 421.

Solitary adenomata of the liver were first described by Rokitskiy in 1859. Since then, they have been found frequently both in adults and in young persons. The author's case was that of a woman of thirty-four years who complained of a swelling the size of a small orange at the level of the right iliac fossa, which had progressively grown larger. Palpation revealed a hard, rounded body with a smooth surface situated a few centimeters below the costal margin and extending obliquely toward the median line. The findings of all laboratory examinations were relatively normal. Roentgen examination showed the stomach displaced toward the left. The tumor was not opaque to the X-rays. Its presence was revealed only by the displacement of other organs. The location of the neoplasm was difficult to determine, and to the differential diagnosis it was necessary to consider the possible presence of a tumor of the liver, a retroperitoneal tumor and a tumor of the right pararenal space.

Operation revealed a violet-colored neoplasm the size of a fetal head at term, which was attached to the lower surface of the liver by a slender pedicle. The liver was normal in appearance and consistency. The tumor was enucleated and removed. Except for a toxic delirium, recovery was uneventful. The patient is now in good condition.

The neoplasm was examined histologically with the use of a number of stains. The capsule consisted of two layers, in both of which the cells were arranged concentrically with the margin of the tumor. Above the blood vessels, which were few, there was very little cellular infiltration. Only traces of bile capillaries and hepatic cells could be found. The hepatic lobules were very primitive and incomplete, and were distinct only in certain zones. Some of the cells were polyhedral and others were cubical. The cytoplasm was transparent and often finely granular. The nuclei were sometimes central and sometimes eccentric. They were non-hyperchromatic, large, clear and vacuolar. Not infrequently there were two nuclei in one cell. Fleshy and there were much larger cells which were slightly hyperchromatic and presented fine vacuoles and brownish-yellow pigment granules. A considerable number of cells containing small fat droplets were seen. The vascular connective tissue stroma was represented by numerous connective tissue fibers and fibroblasts.

This type of tumor may arise spontaneously from any point in the liver. It may or may not be pedunculated. Its size, shape, and external appearance are very variable. It is usually hard, but sometimes may be somewhat fluctuant because of cystic degenera-

tion. The cut surface is usually a deep reddish-brown in certain zones and a brownish-yellow to dark green in others. The difference of appearance depends upon the degree of degeneration. The tumor is usually encapsulated and therefore benign. In most cases excision is possible. In the rare instances in which the tumor is adherent to the peritoneum or some other organ it may undergo malignant change. The authors apply the term "solitary" to this neoplasm to indicate that there is total absence of associated hepatic lesions.

The diagnosis often some difficulty but can usually be made from the position of the tumor and by the use of clinical tests.

As a rule the prognosis is favorable. Because of the functional disturbances and the possibility of malignant change, the tumor should be removed.

A. E. TART, M.D.

Rabinowitch, I. M.: On the Morbidity Resulting from Surgical Treatment of Chronic Gall-Bladder Disease in Diabetic Mellitus. *Ann. Surg.* 1924, 179, 70.

The incidence of chronic gall-bladder disease in adults is the diabetic clinic of the Montreal General Hospital was found to be about 15 per cent. With the introduction of newer and more exact methods of cholecystomization the recognized incidence of gall-bladder disease is general in increasing, but the difference in the incidence of the condition in diabetic and non-diabetic persons is still marked.

When diabetes and disease of the gall bladder are found associated, the diabetes is generally attributed to pancreatitis caused by biliary infection.

Surgical treatment is now recommended for chronic infections of the gall bladder not only to control active diabetes, but also to prevent the development of diabetes. The results of such treatment are encouraging as in most cases the carbohydrate tolerance is improved.

The author compares the results of surgical treatment in 50 cases of diabetes complicated by chronic infection of the gall bladder which were operated upon by a surgeon and in 170 cases of chronic gall-bladder infection without diabetes. The post-operative course in the 2 groups was practically the same. The mortality was 4 per cent in the cases with diabetes and 5.5 per cent in those without diabetes.

WILLIAM R. BRACEGIRDON, M.D.

#### MISCELLANEOUS

Lorenze, R.: Diaphragmatic Hernia (La hernia diafragmatica). *Ann. ital. di chir.* 1925, 222, 1993.

Lorenze reports a case of diaphragmatic hernia in a laborer forty-one years of age, who had received a gunshot wound of the thorax two years and seven months before the onset of symptoms.

The earliest symptoms were referred to the abdomen, resembling closely those of the high gastric described by Ramond. This condition has its origin in trauma to the stomach at the level of the oesophic

# GYNECOLOGY

## UTERUS

Phaneuf, L. E. Radium Therapy in Uterine Hæmorrhages of Benign Origin. A Clinical Study of 105 Consecutive Cases. *Am J Obst & Gynec*, 1932, **LXIV**, 225

In 105 cases of uterine hæmorrhage due to a benign condition which were treated with radium there was no mortality. In 15, fibromyomata smaller than a two months' pregnancy were present. In 14 of the latter the tumors disappeared and permanent amenorrhœa was established. In 1 case hysterectomy was performed later for pelvic pain. Of 7 adolescent and young adult women who received doses of irradiation ranging from 400 to 600 mgm-hrs, 4 were benefited by 1 dose, 1 required a second dose, 1 required a third dose, and 1 was subjected to hysterectomy by another surgeon for recurrence of the menorrhagia after a dose of 600 mgm-hrs.

Of 72 middle-aged women, 1 was benefited by a dose of 500 mgm-hrs and continued to menstruate. Of 71 who received sterilizing doses, permanent amenorrhœa resulted in 70. However, 1 who received a dose of 1,725 mgm-hrs was subjected to hysterectomy some time later because of recurrence of the hæmorrhages. This patient's physical condition had so improved during the period of amenorrhœa produced by the radium that the reaction from the operation was slight and recovery was uneventful.

In the cases of 44 women in this group, the treatment included 11 types of operation in addition to the irradiation. In the cases of 11 women with hæmorrhages after the menopause the bleeding ceased and permanent improvement was obtained.

Radium employed in suitable doses in properly selected cases is a valuable agent in the treatment of uterine hæmorrhages due to a benign condition. It finds its greatest field of usefulness in the cases of women at or near the menopause who have severe hæmorrhages in the absence of gross macroscopic lesions in the uterus.

In the treatment of hæmorrhages of adolescence it should be used cautiously to avoid hysterectomy and only after medical, endocrine, and hæmostatic treatments have failed. The dose should never exceed 600 mgm-hrs. Radium should not be used to regulate the menstrual periods or to favor pregnancy.

It is of value in the treatment of small fibromyomata of the interstitial type, especially in women nearing the menopause. A single application of an appropriate dose is sufficient to bring on permanent amenorrhœa. These cases may be treated successfully with 0.050 gm of radium.

In the discussion of this report, WARD stated that in the past five years he had seen 309 cases of the type discussed. Four of the patients were under

twenty years of age. In the cases of young girls he uses only a very small dose of radium. He emphasized that the success of radium irradiation in this type of case depends largely upon the technique used. He employs 2 tubes of radium of 50 mgm each, in tandem form and enclosed in a brass capsule covered with rubber. The entire cavity of the uterus is irradiated from the fundus down to the cervix. The radium should be anchored.

TAYLOR said that the limitation placed by Phaneuf on the size of fibroids suitable for the use of radium irradiation is correct as tumors larger than the uterus of a three months' pregnancy, like pedunculated and submucous tumors, are not well controlled by radium. The use of radium in young girls is a dangerous procedure because of the possible effects on the endometrium and the risk of damage to the ovaries.

HEALY urged the use of smaller doses of radium in cases of uterine bleeding of benign origin in middle aged women without tumors. He stated that in the presence of fibroid tumors, good results can be obtained if the tumors are no larger than a three months' pregnancy. In the cases of women under twenty years of age, 600 mgm-hrs is altogether too much. At least six months should elapse between the first 200 or 300 mgm-hrs and a repetition of the treatment.

CORSCADEN agreed with Phaneuf regarding the dosage. Of his cases in which 1,200 mgm-hrs were given the bleeding was controlled in 85 per cent, and of those in which 1,800 mgm-hrs were given it was controlled in 97 per cent. Corscaden has been very cautious in the use of radium in the treatment of older women. For uterine bleeding in otherwise healthy women sixty years of age he is inclined to prefer hysterectomy to radium irradiation even in the absence of a definite diagnosis of adenocarcinoma.

DANNREUTHER stated that in his opinion it is unnecessary to use radium for the menorrhagias of adolescence as in these conditions endocrine and constitutional disturbances are important factors.

KAPLAN said that if uterine bleeding is for the most part an ovarian function and in part an endocrine function, it should be controlled without destroying the endometrium. He agreed with Phaneuf regarding the dosage of radium.

MATTHEWS stated that smaller doses given over a period of six months will give better results than a single large dose.

SMITH reported on 111 cases of metritis and 34 cases of fibroids. The radium dose was increased from 1,200 to 2,400 mgm-hrs, which latter is the usual dose now employed.

PEIGHTAL said that in 1917 he started with a dosage of 500 mgm-hrs even in cases of fibroids. He

or regional anesthesia of the splanchnic sympathetic branches anesthesia of the perivascular plexus may be used. For resection of the hepatic loop diffusion anesthesia is recommended.

8. For other interventions on the abdominal viscera, anesthesia of the perivascular plexus is recommended.

9. For the liberation and resection of adhesions and in cases of acute inflammation of the abdominal viscera high frequency currents may be used successfully with local anesthesia.

10. Percutis is especially suited for diffusion anesthesia of the abdominal viscera.

For vagosympathetic anesthesia the author injects from 50 to 100 c. cm. of a 0.5 per cent solution of percalin into the upper abdominal cavity before

opening the peritoneum. From two to five minutes later he opens the peritoneal cavity and injects from 50 to 100 c. cm. into the subdiaphragmatic space, and after another period of from two to five minutes he hydrocain anesthetizes of the anterior perivascular gastric plexus from the periphery toward the center. This method may be designated as vagosympathetic diffusion anesthesia combined with anesthesia of the perivascular plexus."

The action of percalin is more prolonged than that of novocain. Adrenalin or epinephrin are added to the percalin solution and the anesthesia is preceded by an injection of pentopon with atropium or a trophic. Percalin anesthesia combined with an injection of atropin is indicated especially for interventions on the stomach and biliary tract. *Kerr S. Moore.*

cured, whereas of those irradiated only 30 per cent remained well for five years. Moreover, the patients treated surgically showed greater permanence of results after the five-year period than those who were treated by irradiation.

The author does not describe the technique for radium therapy which has been adopted in his clinic. The operations performed in the cases reviewed were radical and carried out according to the Wertheim or Schauta technique.

Auer believes that repetition of irradiation is of considerable importance and should improve the survival rate. In certain cases a combination of surgery and irradiation seems definitely the best procedure. In cases of cancer extending beyond the cervix the only hope of cure is offered by radium and roentgen therapy, but the author believes that in cases of early cancer of the cervix the best results are obtained by radical surgery.

GEORGE H. GARDNER, M D

Miller, C J. A Clinical Consideration of Hysterectomy. *J Missouri State M Ass*, 1932, XXX, 347

Hysterectomy is today the most abused operation in gynecology. While it is perhaps the safest of the major procedures, its use is not justified when a simpler, safer procedure would achieve equally good results. The often quoted mortality of 1 or 2 per cent is the mortality in cases in which the operation is performed by expert surgeons and in highly organized clinics. When the operation is performed by the average surgeon the mortality is never under 5 per cent and may be as high as 10 per cent.

In the absence of definite uterine disease, hysterectomy is not warranted today in 1 per cent of the cases of uterine bleeding. Uterine bleeding does not necessarily originate in the uterus. The value of radium must be borne in mind. For hydatiform mole hysterectomy has never been justifiable. While it is true that 50 per cent of all cases of chorionepithelioma develop after this condition, the reverse of the statement is certainly not true.

As a method of sterilization, hysterectomy is not desirable because sterilization may be obtained with less danger by resection of the tubes or graduated irradiation. The advisability of routine hysterectomy in the course of salpingectomy for specific disease is at least debatable. If it is necessary to perform a bilateral excision of the adnexa and thus render the uterus a functionless organ, hysterectomy is justified if it will add little to the risk of the operation. It is indicated also if the uterus is diseased, if it is so denuded during the operation that adequate peritonization is impossible, and if the round ligaments are so involved in the inflammatory process that a proper suspension is impossible. In the absence of uterine disease and when conservation of one or both ovaries is possible, routine hysterectomy is entirely illogical.

In the author's opinion hysterectomy should not be done for puerperal infection, but is indicated in uterine inversion with intrinsic disease of the uterus.

It is not necessarily indicated by inversion *per se*. Among its indications are the hyperplasia that follows subinvolution, chronic fibrosis, chronic metritis, and the pyometra seen rather often in women in the postmenopausal years when surgical dilatation has failed to effect a cure.

The chief indication for hysterectomy is uterine fibroids. However, fibroids do not always require treatment. A symptomless fibroid should be kept under observation. In the cases of young women the procedure of choice for fibroids is myomectomy, whereas in the cases of women of the menopausal age in whom uterine function is no longer a consideration the best treatment may be irradiation. The indications for hysterectomy in cases of fibroids may well be described as the contra-indications for myomectomy and irradiation. They are (1) multiple fibroids which in the aggregate are larger than a pregnancy of three or three and a half months, (2) adenomyomata, (3) tumors associated with adnexal disease, (4) tumors wedged in the pelvis, (5) tumors causing vesical disturbances or other symptoms due to pressure, and (6) tumors which are undergoing degeneration evidenced by low-grade fever or anemia out of proportion to the blood loss. Surgery is the method of choice also in cases of indigent and working women to whom promptness and permanence of cure are usually of more importance than the preservation of uterine function.

There is rarely an excuse for hysterectomy in the course of pregnancy complicated by fibroids. In this condition only observation is necessary as a rule and delivery may be effected at term by cesarean section if spontaneous labor is impossible.

Chemical hysterectomy is to be condemned.

Vaginal hysterectomy is the procedure of choice in the cases of obese, elderly women in whom post-operative complications and abdominal hernia are dangerous possibilities. It is of value in uterine prolapse when the displacement is too great for the interposition operation, when atrophy has rendered the uterus useless as a support for the bladder, when intrinsic disease of the uterus calls for extirpation of the organ, in the rare cases of inversion, and in cases of fibroids of moderate size associated with uterine prolapse. Morcellation may be done. Vaginal hysterectomy should not be performed through a contracted vagina, when the uterus is a very large uterus, when adnexal disease is present, or when the broad ligaments lack elasticity.

Successful results from hysterectomy depend chiefly on proper control of the blood supply. Multiple growths present many problems. Impaction, tubal disease, and adhesions may cause difficulties. In the presence of such conditions either rotation or bisection may be done. In the use of the rotation technique the diseased adnexa and the complicating adhesions are entirely ignored at the beginning of the procedure. The tumor mass is gently rotated to one side so as to expose the top of the broad ligament on the other side and the blood supply of that side is controlled under full vision before the uterus is

then gradually increased the dose to about 1,900 mgm.-kni., but now in cases of fibroids, uses only from 700 to 900 mgm. kni. R. L. CONNERY, M.D.

Haeppelroem, P.: The Ovaries and Endometrium in Women with Myomata (Ovarien und Endometrium bei Myomatosen) *Zeits. f. Geburtsh.*, 1932, 64, 36.

The author reports a study of the ovaries and endometrium in the cases of fifty-six women with myomata who ranged in age from thirty-two to sixty-nine years. In the cases of twenty-eight of the women the ovaries were of the normal weight, 8 gm. Eleven women had one ovary of normal weight and one which was somewhat over the normal weight. In the cases of seven women both ovaries were over the normal weight. In the women who were more than forty-five years of age the fallopian tubes were somewhat smaller and lighter. The size of the myoma had little relation to the size and weight of the ovaries, and there seemed to be no special relationship between the number of graafian and atretic follicles and the myoma. The corpora lutea showed no variations from the normal. A large number of corpora albicantia indicated only increasing age.

Hemorrhages into the ovaries were found in thirty-six cases. In twenty-four they were bilateral. In nine cases they occurred in one or more graafian follicles. In ten, in the corpora lutea, and in eleven, in lutein cysts. They were most frequent in cases of fibrous myomata of medium size.

So-called cystic degeneration was found in thirty cases. In six, it was unilateral. In fourteen cases, lutein cysts, and in seventeen cases, cystic hemorrhages, the results of degeneration of the superficial epithelium, were found in addition. Signs of inflammation were present in thirty cases. Small fibromata were found in seven. In seventeen cases the ovarian vessels were hyalinized only moderately or not at all.

The endometrium was studied in fifty-four cases. In twenty-three it was entirely normal, and in twenty-one it was atrophic. Hypertrophy was found in four cases and adenomyositis and tuberculosis were found in one case each.

When women with myomata menstruate normally the myomata may be of any size, but are usually subserous. When menstruation is irregular the myomata are usually just beneath the mucosa whatever their size. Sterility increases with the size of the myomata. (Fifteen of the women studied were sterile.) Nevertheless the ovaries are often normal.

HANS O. MCNEALON (G).

Spencer, H. K.: Total Abdominal Hysterectomy for Myomata of the Uterus. *Bull. N. Y.* 1932 1, 157.

For thirty-two years the author has routinely performed complete hysterectomy in preference to subtotal or supravaginal hysterectomy. He was led to adopt the more extensive operation because of complications which may follow the subtotal procedure, such as hemorrhage, erosions, discharges,

fistula, and the development of malignancy in the cervical stump. In 6.6 per cent of the myomata which he removed sarcomatous changes were found, and in some cases in which a diagnosis of myoma was made a recurrence developed in the form of sarcoma. Previously unrecognized cancer of the cervix was found in 1 per cent of 900 myomatous uteri, and unsuspected cancer of the body of the uterus in 1 per cent of this series.

It is difficult, almost impossible, to determine how frequently cancer of the cervix arises after subtotal hysterectomy. Pollak collected 576 cases in which cervical cancer appeared a year or more after hysterectomy and Minod collected 300 similar cases in France. It is estimated that about 3 per cent of the cancers of the cervix treated at the radium centers in Europe are cancers arising in the cervical stump left by a supravaginal hysterectomy. Moreover it appears from French and German statistics that cancer is possibly 100 times more likely to occur in a cervical stump than in a cervix from which the body of the uterus has not been amputated.

When the complete operation is performed by competent operators with a well-developed technique there is practically no difference between its mortality and that of subtotal hysterectomy.

CARROLL H. QUINCY, M.D.

Martindale, E. H.: Leucoplakia of the Cervix Uteri. A Manifestation of Early Malignant Change? *Am. J. Obs. & Gynec.*, 1932, 127, 57.

Leucoplakia of the uterine cervix as a clinical and pathological entity has been reported infrequently. The epifibroid changes in some leucoplakic plaques have all the cytological characteristics of cancer except the attribute of invasion (basalotrophy). The author calls attention to the importance of Hinselwood's work on cancer prophylaxis. He believes it possible that small leucoplakic areas may represent cervical cancer in its earliest stages when its eradication would be relatively simple.

R. L. CONNERY, M.D.

Ames, E. A.: Carcinoma of the Cervix Uteri. A Statistical Survey of Twenty-One Years of Treatment. *J. Am. M. Ass.* 1932, 100, 119.

This report is based on 498 cases of cancer of the cervix treated at the Barnard Free Skin and Cancer Hospital, St. Louis, in the period from 1906 to 1926 inclusive. In computing the percentage of cures the author considered patients who could not be traced as having died of cancer.

The incidence of five-year cure for the entire period of twenty-one years was 0.64 per cent; that for the period from 1906 to 1916, 4.76 per cent; and that for the period from 1917 to 1926 11.66 per cent. Radium was first used at the Barnard Hospital in 1917 but the improvement in the statistics after its introduction cannot be attributed entirely to radium therapy. Of the patients with cancer restricted to the cervix who were operated upon in the period from 1917 to 1926, 56 per cent were

come so large that the solid part of the tumor may appear as a mass in their walls. The cyst wall is occasionally serous or contains a mixture of Brenner epithelium and mucin cells.

Characteristic of the Brenner tumor are indifferent cells containing glycogen. The arrangement of these cells in epithelial strands without the intrusion of fibrillar elements slightly resembles that of carcinoma cells. These cells tend to swell up and form lacunæ of various sizes with a colloid, mucus, or mixed content. The mucinous cells arise from the indifferent cells. The epithelial cells are found in small scattered collections or grouped together in larger masses in a usually very tough, fibrous connective tissue stroma which forms a large part or the largest part of the solid tumor mass. The epithelial portions of the tumor do not arise from the ovarian parenchyma or its precursors, but are formed by special cells which have no relation to the normal cellular structure of the ovary and are recognized as abnormal deposits in the Walthard cell groups. Their development is due to the special capacity of the superficial epithelium for local and general differentiation, which is manifested normally by the ability of the colomic epithelium in the region of the wolffian body to form Mueller's epithelium and is manifested abnormally in the region of the tubes and ligaments by the formation of solid epithelial nodules and larger spaces with indifferent epithelium and occasionally the formation of tubules of mucinous and cylindrical epithelium. Such structures are formed also from the superficial epithelium of the ovary.

In tumors there may be formed from the collections of Walthard cells not only mixed or contiguous masses of indifferent Brenner epithelium and pseudomucinous cysts, but also serous cystomata. Likewise, pseudomucinous cysts without demonstrable Brenner epithelium may develop from them.

Genetically, Brenner tumors belong in a systemic series beginning with the majority of serous cystomata, adenomatous, papillomatous, and partially, fibromatous cystomata, and continuing on to the adenofibromata and mixed seromucinous tumors. Only a small number of pseudomucinous cysts and cystomata arise from the Walthard cells. The serous covering harbors all of these possibilities of development. The greater part of the pseudomucinous cystoma is the endodermal portion of a teratomatous anlage arising in the early embryonic period of the segmentation sphere.

The Brenner ovarian tumor is benign. It does not recur or metastasize. No relationship of malignant tumors to the same tissue anlage has been recognized.

The Brenner tumor has no special clinical characteristics besides its frequency at more advanced ages (50 per cent of tumors of this type are found in persons more than fifty years of age) and its benign character.

Statistical, morphological, clinical, and experimental researches should be undertaken to explain the common ovarian tumors in relation to the tissue anlage from which they develop and the general conditions surrounding their formation.

HANS O. NEUMANN (G)



freed to the depths of the pelvis. After this has been repeated on the other side the delivery of the mass is simple.

In the bistection technique the uterus is split longitudinally and then cut across at the cervical level from the inner side. Control of the blood supply is effected, the usual procedure being reversed. With the elimination of one-half of the uterus, more space is obtained and the danger to the ureters is reduced.

Miscectomy and removal of the "key fibroid" are also of aid.

Complete hysterectomy should not be done routinely. It is indicated when the cervix is lacerated or is the site of infectious disease. Preliminary repair of lacerations is sometimes preferable, as is supravaginal amputation of the corpus after vaginal amputation of the cervix. For malignancy of the fundus, hysterectomy is the accepted treatment. The adnexa must be removed routinely. The diagnosis should be established positively before hysterectomy is considered. Preliminary preparation of the vagina is essential.

Chorionepithelioma and sarcoma of the uterus and carcinomas of the cervix require different treatment. If operation is done it must be very radical. The estimate of operability is largely personal. The average American gynecologist seldom admits an operability of more than 15 per cent in cases of carcinoma of the cervix. It is questionable whether the end results of surgery in this condition justify its continued use. Radium irradiation yields much more encouraging results and is in the author's opinion the treatment of choice.

ROWLAND M. FORTNAUD, M.D.

Wells, H. A.: End Results After Excision of the Cervix Interpreted from Pathological Findings. *Am. J. Obst. & Gynec.*, 1931, xxix, 37.

Pathological examination of the cone removed in excision of the cervix proves that the removal of endocervix is incomplete. Therefore a segment of endocervix is retained after excision or amputation of the cervix.

In partial infection of the cervix, the presence of healthy endocervix at the apex of the cone indicates that the endocervical segment above the level of transection is healthy. Under such circumstances surgical excision is adequate for clinical relief.

Clinical failure results from operative contamination and infection. Dilatation and curettage and radium insertion performed simultaneously with cervical excision afford an opportunity for infection. Infection is favored also by vaginal packing for post-operative hemorrhage.

When the cone is found to be completely infected the segment of endocervix remaining *in situ* may be either healthy or infected. If it was healthy before the operation, operative infection leads to post-operative discharge. If it was infected before the operation, as can be determined from concomitant endometritis, the bacteremia will persist.

E. L. CONNELL, M.D.

## ADnexAL AND PERIUTERINE CONDITIONS

Shaw, W. C.: The Pathology of Ovarian Tumors. *J. Obst. & Gynec. Brit. Emp.* 1931, xxxix, 34.

The author discusses pseudodermatous cystadenomas, tumors of ovarian origin (teratoid tumors) and fibroid cysts.

Of 300 ovarian neoplasms studied, 91 (30.3 per cent) were pseudodermatous cystadenomas. The average diameter of the latter was 12 in. In 6 cases the tumors were bilateral. Torsion occurred in 17 cases. Most of the patients were between thirty and sixty years of age. As a rule menstruation was not disturbed. Eighteen of the patients had been tapped. In no case did the tapping have an ill effect. Tapping facilitates the removal of large tumors. The author discusses the development, degeneration, and histology of pseudodermatous cystadenomas.

Tumors of ovarian origin (teratoid tumors) include dermoid cysts and solid teratomata. There were 22 cases of dermoid cysts in the author's series. In 9 of these there was a combined dermoid and pseudodermatous cystadenoma. Most of the patients with ovaries (teratoid tumors) were between the ages of twenty-one and thirty years. The combined tumors are most common in early adult life and simple dermoid cysts at about the age of the menopause. In 4 (17.4 per cent) of the cases the tumors were bilateral. Most of them were from 4 to 5 in. in diameter. There was only 1 solid teratoma among the tumors studied. Solid teratomata are very rare. They have been attributed to a regular proliferation of the chorion of the embryonic area of a dermoid cyst or combined tumor.

There were 16 fibroid or parovarian cysts among the 300 tumors studied. Most of the patients with such cysts were between the ages of twenty-one and thirty years. The tumor was bilateral in only 1 case. The largest was 12 in. in diameter. Fibroid or parovarian cysts are invariably benign. In their removal the fallopian tubes and ovaries are preserved.

HARRY M. NELSON, M.D.

Meyer, R.: The Various Types of the So-Called Brenner Ovarian Tumor. Its Differentiation from the Granulosa-Cell Tumors and Relationship to Other Ovarian Tumors (Ueber verschiedene Entwicklungsformen der als Typus Brenner bekannten Eierstockgeschwülste, ihre Abgrenzung von den Granulosa-Zell-tumoren und Zusammenhang mit andern Eierstockgeschwülsten). *Arch. f. Gynak.*, 1931, cxlviii, 34.

This discussion of the Brenner type of ovarian tumor is based on five of the author's cases and eight cases studied by others. Meyer concludes that the Brenner tumor is macroscopically and microscopically a distinct type of tumor of the ovary which is in no way related to the granulosa-cell tumors that exert a hormonal action on the uterus. The Brenner tumor has no demonstrable functional effects. It occurs as a solid structure which may contain small cysts with an epithelial lining ranging from a slightly to a definitely mucinous type. The cysts may be

because of moulding it becomes a bluntly pointed cylinder

3 There is an unequal flexibility of the head on the trunk in different directions

4 On the basis of these facts it is possible to construct models which demonstrate internal rotation

5 It is possible to give a mathematical explanation for the rotation

6 Internal rotation of the head in a vertex or face presentation, rotation of the shoulders, rotation of the pelvis in a breech presentation, and rotation of the aftercoming head can all be adequately explained.

7 Persistent occiput-posterior and persistent mentum-posterior presentations present points of special interest which can readily be accounted for by the theory of unequal flexibilities

A. H. GLADDEN, JR., M.D.

Mussey, R. D., Watkins, C. H., and Kilroe, J. C. Observations on Secondary Anæmia During Pregnancy *Am J Obst & Gynec*, 1932, **xxiv**, 179

A morphological study of the blood was made in the cases of eighty-two women with secondary anæmia during pregnancy. The anæmia of fifty-eight was classified as of Type 1 and that of sixteen as of Type 2. Seven of the women presented changes characteristic of both types. The anæmia of one patient could not be classified.

Evidence of toxicity was found in forty-one of the fifty-eight cases of anæmia of Type 1 and in ten of the sixteen cases of anæmia of Type 2. The toxic factors causing the changes in the blood cells were not determined.

This is a preliminary report of observations on secondary anæmia during pregnancy which is relatively common and tends to increase as the pregnancy progresses.

The anæmia of Type 1 seems to be a true anæmia of pregnancy, characterized by suppressed activity of the bone marrow early in the pregnancy and evidence of hæmolytic when the bone marrow becomes more active in the later months. After delivery there is a tendency toward spontaneous recovery. It seems probable that severe cases of this type of secondary anæmia make up a large percentage of the cases in which the anæmia was formerly described as being of the pernicious type or as resembling the pernicious type.

It seems probable that the anæmia of Type 2 is present prior to pregnancy, grows worse during pregnancy, and persists after delivery. In the cases reviewed, organotherapy, such as the use of extracts of bone marrow and powdered fetal liver, was not followed by appreciable improvement. However, its failure may have been due to insufficient dosage or inability of the patient to take the product. In 75 per cent of a small group of cases the use of ferric citrate or ferric ammonium citrate in large doses—from 20 to 30 gr. three times a day—was followed by a distinct increase in the hæmoglobin.

Dodds, G. H. The Immediate and Remote Prognosis of Pyelitis of Pregnancy and the Puerperium *J Obst & Gynec, Brit Emp*, 1932, **xxxix**, 46

In the Obstetrical Unit of the University College Hospital, Edinburgh, the incidence of antenatal pyelitis was 1.1 per cent, and that of postpartum pyelitis, 1.6 per cent. An analysis of the 124 cases of pyelitis (68.0 per cent antenatal, and 32.0 per cent postpartum, pyelitis) showed that the immediate prognosis of the pyelitis of pregnancy is good. However, only 2 of the 84 women with antenatal pyelitis were completely cured in the sense that the urine was sterile on culture and in the cases of 30 per cent of this group spontaneous premature termination of the pregnancy occurred. Of the 40 women with pyelitis starting in the puerperium, 2 died, but only 1 of the deaths could be attributed to the renal condition, pyonephritis associated with, and due to, a calculus impacted in the ureter.

Of the women with antenatal pyelitis, 49 per cent were completely cured, 35 per cent developed chronic pyelitis, and 16 per cent had continued bacteriuria only. Of those with postpartum pyelitis, 60 per cent were ultimately cured completely, 10 per cent developed chronic pyelitis, and 30 per cent had continued bacteriuria only. In the cases of antenatal pyelitis, pyrexia persisting for more than sixteen days was usually associated with an unfavorable prognosis as 60 per cent of the women with such fever developed chronic pyelitis. Therefore the prognosis seemed to be considerably better in postpartum pyelitis than in antenatal pyelitis.

Of the cured cases of antenatal pyelitis, 56 per cent cleared up within one year after delivery, and in about half of these recovery was complete as early as three months after delivery. Of the cured cases of postpartum pyelitis, 80 per cent cleared up completely within six months after delivery.

In the cases of patients with antenatal pyelitis no recurrence of acute pyelitis was observed in subsequent pregnancies. Seventy-eight per cent of the patients were quite normal in succeeding pregnancies, but 22 per cent suffered from chronic pyelitis which had persisted in the interval between the pregnancies. Of the patients with postpartum pyelitis, 80 per cent had acute pyelitis in the succeeding pregnancy. The author is unable to explain this fact, but found that 50 per cent of the patients suffered from persistent bacteriuria in the interval.

A. F. LASH, M.D.

Young, J., Sym, J. C. B., and Crowe, E. V. An Evaluation of the Incidence of and the Maternal Disability Following Eclampsia and Albuminuria *Proc Roy Soc Med*, Lond, 1932, **xxv**, 1235

The authors state that we have no data by which accurately to compute the incidence of, or the damage inflicted by, the toxæmias of the later months of pregnancy (pre-eclampsia and eclampsia, albuminuria, hypertension) in the community at

# OBSTETRICS

## PREGNANCY AND ITS COMPLICATIONS

Murray H. L.: Tubal Gestation as Seen by the Gynecologist: An Analytical Study of Certain Aspects, Clinical and Pathological, of a Consecutive Series of 166 Cases. *Proc. Roy. Soc. Med. Lond.*, 1932, **XXV**, 1378

The author discusses the etiology and terminations of tubal pregnancy on the basis of 146 cases occurring in his practice. The causes in these 146 cases were as follows:

	Right	Left	Total
No cause found	16	6	22
Intracanal trouble			
Direct evidence	4	2	6
Suggested by recurrent tubal gestations	1	1	2
Suggested by recent vaginal operations with coitus			
Suggested by unusual history after abortion or injury	4		4
Extracanal trouble			
In utero	13	7	20
Suggested by previous operation on lower abdomen	1	14	15
Suggested by infection spread bilaterally for female, tubes being normal			
Total	26	28	54

Of 67 cases in which the vermiform appendix was removed, there was a record of an active inflammation deposit in the outer layers in 30 (45 per cent). The author believes that the appendix may be an important factor in the etiology of tubal gestation.

The possible terminations of tubal gestation include spontaneous cure, rupture, and continued growth.

Spontaneous cure may occur by extrusion or by absorption *in situ*. In 33 of the cases reviewed extrusion had almost occurred or appeared likely to occur. Histological evidence of absorption *in situ* was found in only 1 case.

Rupture includes primary (intracanal rupture (abortion or mole), primary extracanal rupture (intraperitoneal and intraligamentary) and secondary extracanal rupture (intraperitoneal and intraligamentary). Of the cases reviewed, primary intracanal rupture without further complications occurred in 95 per cent. None of the cases showed primary extracanal rupture. The author doubts whether primary intraperitoneal rupture occurs often in the usual type of tubal gestation. Secondary intraperitoneal rupture occurred in 6 cases and in all of them was lethal. Secondary intraligamentary rupture occurred in 3 cases and in both was originally lethal.

There were no cases of continued growth. In conclusion the author urges more careful recording of the operative findings and examination of the vermiform appendix in cases of tubal pregnancy.

ROBERT M. EMMETT, M.D.

Maschert, W. F., and Lee, H. P.: Urinary Tract Changes During Late Pregnancy and Early Parturition. *Am. J. Obst. & Gynec.*, 1931, **XXV**, 805.

The observations reported by the authors were made in the cases of forty-one normal pregnant women—twenty primiparae and twenty-one multiparae. Of the multiparae, eight had had one child, seven had had two children, and six had had three children or more. The ages of the primiparae ranged from sixteen to twenty-eight years, and those of the multiparae from sixteen to thirty-six years.

All of the forty-one women showed some degree of dilatation of the right urinary tract prior to delivery and the majority showed dilatation also on the left side.

Marked dilatation before delivery and retardation of involution after delivery were more frequent in the primiparae than in the multiparae.

In eight of the women a considerable decrease in the caliber of the urinary tract was observed within twenty-four hours following delivery.

Of twelve normal women, involution was complete in the majority after from nine to eleven days.

Most of the forty-one women showed a marked reduction in the caliber of the urinary tract by the end of the twelfth day after delivery.

In five women with fever in the puerperium involution was sluggish. The authors suggest that delay of involution may be the primary factor underlying the development of postpartum pyelitis.

E. L. CORNETT, M.D.

Molz, C.: The Cause of Internal Rotation of the Fetus, with Special Reference to the Occiput Posterior Position. *J. Obst. & Gynec. Brit. Emp.*, 1933, **XXIV**, 84.

Molz states that internal rotation of the fetus as a whole is explained by the following facts.

The compressed fetus is a cylinder.

The birth canal is a passage of even caliber with a sharp angle at the lower end.

The fetus is forced through this curved canal and in consequence is made to bend on its own axis.

The fetus bends on its long axis with unequal facility in different directions. A rotational tendency arises and as a result the fetus alters its position until the part most easily bent (stretched) coincides with the line of maximum convexity of the canal.

Molz draws the following conclusions:

1. Internal rotation of the fetus during labor is not adequately explained by the usually accepted theories.

2. Investigations show that the shape of the head when it undergoes rotation is altered in essential respects. Because of the attitude of flexion and

147 cases. It often occurred early in labor and was an important cause of fetal death.

The author states that in every case of transverse presentation active measures to prevent early rupture of the membranes should be instituted. For this purpose the use of the vaginal bag is recommended.

For certain cases, particularly those in which the membranes rupture early, the judicious use of cesarean section is advised. E. L. CORNELL, M.D.

#### NEWBORN

Wiener, R. Experiences in the Treatment of Asphyxia of the Newborn and Conditions of Severe Dyspnoea in the Newborn and Infants with Carbon Dioxide Gas Mixtures (Erfahrungen ueber die Behandlung der Asphyxie der Neugeborenen sowie der Zustände von schwerer Atemnot bei Neugeborenen und Säuglingen mit Kohlen-säuregasgemischen) *Arch f. Kinderheilk.*, 1931, xcv, 65.

The author reports on the various methods of treating asphyxia of the newborn. He calls attention especially to the inhalation of carbon dioxide gas mixtures as a procedure which has proved of value. By experimental investigations in clinical cases and on animals it has been demonstrated that the respiratory volume and the respiratory amplitude are increased by the inhalation of carbon dioxide. When the carbon dioxide content of the expired air is 8 per cent, subjective dyspnoea develops. When it is 12 per cent, respiratory amplitude and respiratory volume increase, to sink further with increasing narcosis.

Henderson was the first to treat asphyctic conditions with carbon dioxide inhalations. He recognized that in asphyxia there is no oxygen poverty or

carbon-dioxide overcharging of the blood, but a deficiency of both oxygen and carbon dioxide. This has been proved by therapy, as it has been shown that the best results are obtained with the combined oxygen-carbon dioxide treatment.

The author reports his experiences with inhalations of carbon dioxide gas mixtures in asphyctic conditions, viz., twelve cases of apparent death in newborn babies, twenty-three cases of severe dyspnoea in the first days of life, six cases of respiratory disturbances and collapse in nutritional disturbances, and seventeen cases of disease of the respiratory passages and lungs. The apparatus used consisted of an oxygen bomb and a carbon dioxide bomb, each with a pressure-reducing valve to regulate dosage, an extra bag, and a mask.

In the case of asphyctic newborn babies the attempt is made first to start respiration by carbon dioxide or a carbon dioxide-air mixture. If this is unsuccessful after a few minutes, a mixture of 95 per cent oxygen and 5 per cent carbon dioxide is introduced for from five to ten minutes at a rate of 20 liters of oxygen per minute. However, it is usually possible to relieve the asphyxia by the first method. In almost every case the author saw astonishingly rapid recovery and deepening of the respiration. Particularly good results were obtained in dyspnoeic states due to disease of the respiratory passages and lungs. Improvement occurred in almost all of the seventeen cases of this type and became apparent immediately. Untoward effects were not noted even when repeated inhalations were given. In the cases of fifteen newborn babies who had inhaled the carbon dioxide gas mixture, autopsy revealed no pathological changes, and especially no alveolar tears or emphysema, that could be attributed to the treatment. J. PETERS (G)

large. The figures of the Registrar-General of England represent only the deaths occurring during pregnancy, labor and the puerperium. We do not know the incidences of toxemias during pregnancy and there are no data indicating the extent of the disability sustained by toxemic women who survive the puerperal period or the mortality occurring later as the consequence of this damage.

Of 7,700 successive selected cases of pregnancy admitted to the antenatal department of the Edinburgh Royal Maternity and Simpson Memorial Hospitals, treatment for pre-eclampsia, albuminuria, or hypertension without albuminuria was given in 6 per cent.

It would be of advantage to estimate the frequency with which the late toxemias of pregnancy pass over into eclampsia. As there are no accurate data to indicate the incidence of eclampsia during childbirth in the community at large, this cannot be determined directly. However it can be approximated. The authors conclude that 0.4 per cent of all women with toxemia develop eclampsia. This figure is surprising as Gibberd reported that in a total of 8,000 distinct cases of pregnancy under the care of Guy's Hospital there were only 300 cases of albuminuria with only 5 cases of eclampsia. One of the cases of eclampsia was that of a woman who refused to permit the induction of labor for toxemia. Therefore in this practice the incidence of eclampsia in toxemic women under proper antenatal care is only 1 in 300. Thus there is strong evidence that, while we are unable to prevent toxemia, we can reduce its toxic risks. The fact that under present conditions about 6 per cent of cases of toxemia pass over into eclampsia must be considered a serious criticism of our current methods of maternity care.

The authors studies indicated also that the pre-eclamptic type of toxemia is very liable to recur in subsequent pregnancies. Of 84 women treated for toxemia who had 200 subsequent pregnancies going to term, only 35 per cent were normal in the subsequent pregnancies.

With the object of estimating the nature and incidence of the disability following the late toxemias of pregnancy the authors established a clinic for follow-up investigations. They found that a large proportion of the patients developed chronic debility. In 80 per cent there was marked deterioration of health. The mortality due to damage attributable to the toxemia was 2.1 per cent. The incidence of disability was of course greatest in the women who had had 3 or more toxic pregnancies.

HARRY W. FINE, M.D.

Whitehouse, B.: The Indications for the Induction of Abortions. *Brit. M. J.* 1932 II, 157.

In the cases of women with auricular fibrillation and cardiac enlargement pregnancy should be terminated in the early months. When signs of cardiac failure develop in the later months of pregnancy the risk to life is increased more by interrupting the pregnancy than by allowing it to go to term.

In a period of ten years the author performed sixty-three therapeutic abortions, an average of six and three-tenths per year.

Whitehouse states that it is exceedingly difficult to list indications for the termination of pregnancy which are generally applicable. Probably the best person to decide when a pregnancy should be interrupted in the absence of gross organic disease is the family physician. Whenever abortion is to be induced for medical reasons, the author insists that the patient enter a hospital and that the operation be performed with the same publicity as any other surgical procedure. LEOLOUS GOSWAMI, M.D.

## LABOR AND ITS COMPLICATIONS

Murphy, D. P., and Bowman, J. E.: The Frequency and Causes of Premature Birth. A Report of 238 Cases. *Am. J. Obst. & Gynec.*, 1932, vol. 273.

Of 2,375 consecutive labors in 2 teaching hospitals 215 (more than 8 per cent) were premature as indicated by the infant's birth weight. Approximately 80 per cent of the 215 premature births were spontaneous in onset and the remaining 20 per cent were induced by medical or surgical means. In 75 per cent of the cases of spontaneous premature labor in which the cause could be determined the responsible factor was disease or abnormality of the uterus, its contents, or its appendages.

In approximately 45 per cent of the cases of spontaneous premature labor the cause could not be determined. Spontaneous premature births of unknown cause were equally frequent in colored and white women.

Women under thirteen years of age gave birth more frequently to premature infants than women who were older. The incidence of premature delivery appears to be greater in women who have been previously delivered prematurely than in other women. E. L. CORNELL, M.D.

Eastman, N. J.: Transverse Presentation. *Am. J. Obst. & Gynec.*, 1932, vol. 40.

In 24 cases of transverse presentation studied at the Johns Hopkins Hospital, Baltimore, the maternal mortality was 3.4 per cent. The danger to the mother depends not so much on the mechanical difficulties presented by the transverse presentation as on certain associated conditions, particularly early rupture of the membranes, incomplete dilatation of the cervix, and placenta previa, complications which are often the precursors of intrapartum infection and rupture of the uterus.

In the cases reviewed in which the fetus weighed 2,500 gm. or more, the fetal mortality was 27.6 per cent. If the cases in which cesarean section was done are excluded, it was 37.0 per cent. The factors responsible for the fetal deaths were early rupture of the membranes, slow and incomplete dilatation of the cervix, prolapse of the umbilical cord, and abruptio contractura of the uterus. Hemorrhagic contracture of the uterus was observed in 2.5 per cent of the

A calcified gland, a phlebolith, or a sclerotic artery may be excluded readily, but calculi in a bifid ureter or in a diverticulum of the ureter may be difficult to diagnose. Ureteral pyelography is of diagnostic aid. Intravenous urography aids not only in the diagnosis, but also in the estimation of the amount of renal damage. However, the author calls attention to the fact that renal function may be greatly reduced by a temporary obstruction of the ureter and may return to normal when the obstruction is removed.

Expectant treatment consists of the administration of large amounts of water. This method is indicated only in cases of very small stones which show a definite tendency to migrate downward.

Another conservative procedure consists of cystoscopic maneuvers. The author describes the various ureteral catheters and dilators employed. He prefers the use of the indwelling catheter together with the injection of olive oil, glycerin, and papaverin. This method was employed successfully in 79 of the 122 cases reviewed.

Occasionally ureteral meatotomy is done. Zondek states that the intramural portion of the ureter may be slit on the roof  $1\frac{1}{2}$  cm. in the male and slightly less in the female.

Relaxation of the body by means of hot sitz baths and hot rectal irrigations is advocated.

Ureteral instrumentation is not without danger. In some instances dilatation by the introduction of instruments and the injection of solutions has caused rupture of the kidney or the ureter necessitating immediate operation to save life.

Surgical interference is indicated in cases in which the calculus is impacted or within a diverticulum, cases with constant pain, cases in which the other kidney is diseased, cases of calculus in a solitary ureter, cases in which catheterization is impossible, cases in which severe reactions follow instrumentation, and cases with symptoms of beginning anuria. The operation of choice is ureterolithotomy.

Possible postoperative complications are ureteritis, stricture, periureteritis, and renal infection.

In conclusion the author says that calculus disease of the ureter can be diagnosed definitely in from 95 to 98 per cent of cases. In from 75 to 90 per cent the stone can be made to pass if the ureter is dilated to a diameter greater than that of the stone. Prolonged indiscriminate cystoscopic maneuvers are to be condemned. In cases in which the stone shows no tendency to descend, ureterolithotomy is advisable.

J. SYDNEY RITTER, M.D.

Bolliger, A., and Walker-Taylor, P. N. Late Results After Unilateral Uretero-Intestinal Anastomosis. An Experimental Study with Reference to the Alleged Renal Disuse Atrophy. *Australian & New Zealand J. Surg.*, 1932, 11, 33.

Brief reference is made to the work done by McKenna, Sweet, and Stewart, Baird, Scott and Spencer, Goto, and Hinman and Belt. It was Hinman who postulated the theory of renal disuse atrophy following ureteral transplantation.

The authors' experiments were performed on six dogs. In the cases of three of the animals a left ureterocolostomy was performed, in the cases of two, a right ureteroduodenostomy, and in the case of one, a bilateral ureterocolostomy. The open tunnel technique was used in four of the experiments and the closed tunnel technique in two. Frequent determinations of urea were made on specimens of the blood and on the urine obtained from the rectum. In addition, indigocarmine and phenolsulphone-phthalein tests were carried out and uroselectan was used to visualize the urinary tract.

**Experiment 1** Right ureteroduodenostomy. Repeated catheterization of the rectum showed no fluid. Biopsy twenty-six days after the operation showed the kidneys to be normal and the right ureter to be unobstructed. Four months later conditions remained unchanged. Nine and a half months after the operation the dog died of sepsis due to a skin lesion. Necropsy showed the kidneys to be of equal and normal size.

**Experiment 2** Right ureteroduodenostomy. Laparotomy was done fourteen days after the operation and again five months later. No changes were found in the kidney. Nine months after the operation uroselectan showed the kidneys and ureters to be normal. On palpation a year after the operation the kidneys were found normal. The dog disappeared.

**Experiment 3** Left ureterocolostomy. Because of illness, the dog was sacrificed three hundred and forty-nine days after the operation. A tumor of the spleen was found. The pelvis of the left kidney was slightly enlarged because of linking of the ureter. Both kidneys showed chronic focal fibrosis.

**Experiment 4** Left ureterocolostomy. The right kidney was removed a year later. Four months after the nephrectomy intravenous pyelography showed dilatation of the left renal pelvis and ureter. The dog was in perfect health six months after the nephrectomy.

**Experiment 5** Left ureterocolostomy followed by removal of the right kidney sixteen days later. At the end of two years the dog was in good health.

**Experiment 6** Bilateral ureterocolostomy, the second operation being done nine weeks after the first. Eleven months after the second operation, death followed a large intravenous dose of urea. The right kidney was found hypertrophied and the left showed evidence of infection and extensive fibrosis.

The results of these experiments refute Hinman's theory of disuse atrophy. Atrophy due to infection or ureteral disturbances is not disuse atrophy. As in experiments performed by others, it was found that urine released into the duodenum is re-absorbed. In ureterocolostomy there is a limited but constant re-absorption.

The authors emphasize that successful unilateral ureteroduodenostomy and ureterocolostomy are not followed by atrophy. After ureterocolostomy, the kidney to which the transplanted ureter belongs will function normally even when the other kidney is removed.

CLAUDE D. PICKRELL, M.D.

# GENITO-URINARY SURGERY

## ADRENAL, KIDNEY AND URETER

Kramer, E. E.: Gonorrheal Infection of the Kidney  
*Public. Am. J. Surg.* 1932, xvii, 189.

The author believes that the demonstration by microscopic examination of Gram-negative intracellular diplococci in the urine obtained by ureteral catheterization of a patient with an untreated gonorrhea is sufficient to warrant a diagnosis of gonorrheal pyelitis. A culture to check this finding is unnecessary and, if the ureteral catheters have been sterilized with formaldehyde may not be successful.

While the infection may be carried to the kidney by various routes, it seems most logical to assume that it is spread by way of the blood stream.

The symptoms of gonorrheal infection of the kidney pelvis vary greatly. They may consist in slight cloudiness of the urine or of severe pain in the loins with high fever, chills, and sufficient damage to the kidney to require nephrectomy.

The question as to whether gonorrheal infection of the kidney is primary or superimposed upon a previous infection is of more than academic importance. It is probable that in cases of pure gonorrheal infection of the kidney the kidney was rendered susceptible by mechanical interference with drainage.

The author reports four cases.

ROBERT L. SARNOFF, M.D.

Colombano, M.: Cystic Dilatation of the Lower End of the Ureter (La dilatazione cistica dell'estremità inferiore dell'uretere). *Arch. Ital. di urol.*, 1932 ix, 35.

The condition discussed in this article is an expansion, sometimes cyst-like, of the ureter just before it enters the bladder. It was first described by Smith in 1873. The dilatations containing stagnant urine often contain stones. The author cites two cases. In one, the diagnosis was made by cystoscopy and endoureterography and the patient was cured by resection of the sac by open operation. In the other the diagnosis was made by cystoscopy alone following a renal infection and a cure was obtained by nephrectomy. The author states that this lesion should always be considered in the diagnosis of obscure urinary conditions.

ROBERT T. LLOYD, M.D.

Jenkins, J. A.: The Diagnosis and Treatment of Stones in the Ureter. *Australian & New Zealand J. Surg.* 1932, ii, 1.

As ureteral colic is produced by various lesions of the urinary tract, a definite diagnosis of stone is impossible unless a complete urological examination is made.

A ureteral stone may produce gross damage in its passage without causing pain. Even complete obstruction may be painless.

In the technique used by the author for examination of the urinary tract a plain roentgenogram is first made and a cystoscopic examination then carried out. In the case of males the cystoscopic examination is made under caudal or spinal anesthesia, but in the case of females local anesthesia is used. Just before the cystoscopic examination, iodoglycerine is injected intravenously. Its time of appearance and concentration on both sides are noted. Marked delay or failure of its appearance on one side may mean a decrease of renal function or obstruction of the ureter.

When obstruction is found a wax-tipped bulb or catheter is used through a direct cystoscope. The catheter is lubricated with olive oil. At the site of obstruction a stereoscopic roentgenogram is made.

The ureter is dilated with one or more catheters, either above or below the stone. If possible, the wax-tipped catheter is passed above the stone. The catheter or catheters are left in place. Olive oil, a 3 per cent solution of novocain, and a 1 per cent solution of mercurchrome are injected at frequent intervals. One end of a rubber band is fixed to the catheter and the other end attached to the thigh. Intermitting traction is applied.

In complete obstruction due to an impacted stone operation may be delayed safely for two weeks if infection is absent. If infection is present, operation should be performed immediately. In cases of bilateral lesions conservative treatment is essential.

Factors of importance in the formation of ureteral stones are stasis due to stricture, urinary infections, infections in the kidney and other parts of the body, ureteral obstruction, and vitamin deficiency.

CLAUDE D. PIERCE, M.D.

Marble, C. F.: The Diagnosis and Present-Day Treatment of Ureteral Stones. *J. Urol.*, 1932, xviii, 121.

Marble says that the diagnosis of ureteral stone is not simple as renal colic, hematuria, nausea, vomiting, chills, and fever may be produced by ureteral obstruction of any type. Mucoviscidulous disease of the ureter may simulate appendicitis, cholecystitis, tubal dermoids, duodenal ulcer, ovarian infection, and, in rare instances, intestinal obstruction and lobar pneumonia. In 95 per cent of the cases reviewed by the author an appendectomy or an operation for a pelvic disorder had been done.

Some ureteral calculi can be felt through the vagina or rectum. If possible, cystoscopic examination, ureteral catheterization, and X-ray examination should be carried out.

twenty-four hours and the catheter removed after from eight to ten days THEODORE P GRAUER, M D

Coleman, C A , Mackie, J A , and Simpson, W M Primary Malignant Neoplasms of the Epididymis *Surg, Gynec & Obst*, 1932, 14, 1111

The authors report a case of primary malignant neoplasm of the epididymis and review the literature on these rare tumors Their patient was a man fifty-one years of age The onset of the symptoms was sudden. The nature of the growth was determined only by pathological examination of the removed epididymis The patient refused further treatment and died ten months after the operation The pathological diagnosis was "malignant teratoma of the undifferentiated embryonal carcinoma type" The authors believe that this neoplasm corresponded to the type commonly originating in the testicle and disproved the theory that such tumors have their origin in the spermatoblasts of the germinal epithelium. They attribute the origin of these tumors to pre-existing teratomata in which one of the tissue elements undergoes malignant transformation

DONALD K. HIBBS, M.D

Ross, J M Chorionepithelioma of the Testis. *J Path & Bacteriol*, 1932, xxi, 563

The author reports a case of chorionepithelioma of the right testis in a man thirty years of age The patient presented symptoms suggesting pulmonary metastases At autopsy, metastases were found in the lungs and liver, the retroperitoneal, periaortic, thoracic, and cervical lymph glands, and the vena cava On section of the right testis, which was not enlarged, a soft, yellowish-white tumor was found. The left testis was normal

The article is summarized as follows:

1 A case of testicular tumor is described in which the pulmonary metastases consisted of tissue morphologically identical with typical chorionepithelioma The primary tumor, though small, was largely necrotic.

2 In the abdominal metastases the origin of syncytium and of Langhans cells could be traced to small, cubical, darkly staining cells which also gave rise to the formation of carcinomatous tissue and were found in blood vessels, lymphatics, and the peripheral sinuses of lymph glands

J SYDNEY RITTER, M D



Sauer, H. von: The Clinical Phenomena and Pathology of Primary Tumors of the Ureter (*Zur Klinik und Pathologie der primären Ureter-tumoren*) *Zschr f urol Chir* 1932, xxvii 165.

The author reports two cases of primary ureteral tumor. The first was that of a man fifty-seven years of age who complained of a dull pain in the right lumbar region and a drawing sensation in the region of the bladder. External palpation and cystoscopic examination failed to reveal the cause. Following the intravenous injection of indigocarmine, blue urine came from the left kidney after a period of five minutes, but none came from the right kidney. When a catheter was introduced into the right ureter for a distance of 21 cm. it encountered an obstruction, and when the obstruction was overcome, weakly blue urine containing numerous leucocytes appeared from the right kidney. Intravenous pyelography showed the left renal pelvis to be normal. On the right side, after one hour the outlines of the pelvis could be made out as a plump sac showing no indication of the ureteral lumen and no entrance of the contrast medium into the ureter. Retrograde pyelography disclosed a poorly defined constriction of the ureteral lumen at the level where it opened into the kidney pelvis. A diagnosis of perireteritis was made. When the ureter was exposed it was found to be so embedded in masses of a malignant tumor that attempts to liberate it were given up as hopeless. The patient died despite roentgenotherapy. He presented the signs of cachexia, but did not develop hematuria.

The second case was that of a man seventy-four years of age who had had a transient hematuria three years previously and when examined by the author was suffering from severe hematuria from the right side. In the right ureter the catheter met resistance after it had been introduced a distance of 2 cm. An attempt to overcome the obstruction resulted in renewed severe bleeding. After the catheter had been forced up the ureter a distance of 7 cm. the hematuria ceased and clear urine appeared. When the catheter was withdrawn, blood came from the lower 10 cm. of the ureter. Retrograde pyelography disclosed an irregular widening of the lower third of the contrast shadow of the ureter which suggested that the contrast material running back around the catheter from the renal pelvis was meeting with an irregularly shaped obstruction. Intravenous pyelography disclosed a long defect produced by an apparently villous tumor. On account of his advanced age the patient was not subjected to operation, but was given roentgen therapy.

The treatment indicated for ureteral cancer is extirpation of the ureter and kidney together with the part of the bladder in which the ureteral lumen is situated. When this operation is followed by bronchitis, the prospect of cure is not unfavorable. However, the patient must be watched closely to be sure that if a metastasis appears in the bladder he may be given further treatment immediately.

A. KOSCHOWSKI (2)

## BLADDER, URETHRA, AND PENIS

Greay, C. D.: Sudden Decompression of the Chronically Distended Urinary Bladder: A Clinical and Pathological Study. *Arch Surg* 1932, xiv 354.

Following a review of the literature the author reports his observations in seventy-one cases of prostatic hypertrophy with urinary retention in which death resulted while the patient was under treatment. He draws the following conclusions:

1. Many patients with chronic incontinence retention of the urine undoubtedly die as a direct result of catheterization.

2. That death may result solely from the mechanical effect of this sudden emptying of the bladder has been claimed repeatedly but has not been proved.

3. Most patients who die as a result of catheterization die of infection.

4. Whether there is any connection between the rate at which the bladder is emptied and the fatal issue (infection) is a moot question.

5. It seems more likely that the introduction of infection into a urinary tract prepared by longstanding obstruction is the cause of the fatal issue, regardless of the rate at which the bladder is emptied.

6. The value of gradual emptying of the chronically distended bladder is therefore open to question, although complete abandonment of this procedure is perhaps not justified. DONALD K. HARRIS, M.D.

## GENITAL ORGANS

Closs, W. J.: Prostatectomy with Closure of the Bladder with Reference to a Modification of the Harsh Operation. *Med. J. Australia*, 1932, 4, 47.

The author offers a modification of the Harsh method of prostatectomy in which the bladder is closed at operation. He has tried this modification in six cases. In five, it was successful. In one case re-opening of the bladder was necessitated by secondary hemorrhage due to a retained gauze tampon.

The usual suprapubic incision is made. The excision of the prostate is performed intra-urethrally in order to preserve as much mucosa on the bladder aspect as possible. Next, a purse-string suture of No. 2 plain catgut is passed in and set around the margin of the bladder mucosa, the latter being transfixed at six or seven points by means of a boomerang needle. Then, a No. 12 E. Pratt catheter is inserted and carried through the urethra by means of a special instrument much like the mandarin used to carry an ordinary urethral catheter. The purse-string is tightened around the Pratt catheter behind the bulge and traction sufficient to control the bleeding is made by fixing the catheter to the thigh with adhesive tape. The bladder is tightly closed and the space of Retzius drained with two rubber drains. The traction is released after

The article contains a review of solitary plasmacytomas reported by others and presents evidence supporting the conclusion that these are true neoplasms and not inflammatory processes

CHESTER C. GUY, M.D.

Hansen, J. Open Wounds of the Large Joints (Die offenen Verletzungen der grossen Gelenke) *Deutsche Ztschr. f. Chir.*, 1932, cccxxv, 468

The author reports on open wounds of the joints treated in the Bochum Hospital in the period from 1925 to 1930. The 75 joints involved included 37 knees, 21 foot joints, and 17 elbows. The basis of the treatment of such wounds consists of immediate closure after extensive excision of contaminated and frayed tissues, the removal of splintered bone and cartilage, the reduction of fractures and dislocations, and irrigation with phenol-camphor, a small amount of which is left in the joint. Menisci are extirpated and not sutured. Large joints, like the condyles, are nailed. The patella is sutured with silk. After several days of rest in a Volkman splint, the joint is carefully exercised. When flexion of 90 degrees is possible the patient is permitted to get up as this induces his active cooperation. In the presence of joint infection, Payr's method is used, the joint being aspirated, irrigated with phenol-camphor, incised, drained, and, if necessary, resected and amputated. Flail joints must be kept under careful observation as in time they become looser and the patient may then receive no disability compensation.

The author presents an interesting historical review of the methods of treating joint wounds which indicates that, in this field also, old views and methods are returning. Of thirty-seven wounds of the knee joint, 19 were caused by the blow of an ax. Of the latter, ten were completely healed within a period of from five to eight weeks. In injuries caused by dull force the results were much less favorable. Of the patients with such wounds, only five were able to return to work within five weeks. However, amputation was necessary in only two cases. In the cases of ax wounds there were two deaths, but in those of wounds due to dull force there was no mortality.

In the cases of wounds of the ankle the results of extirpation of the astragalus, which was done in three, are particularly interesting. Primary removal of the astragalus was done because healing seemed hopeless. The period of convalescence was therefore prolonged up to twelve months. The permanent disability was 50 per cent. Ankylosis at 90 degrees caused disability of 20 per cent, and ankylosis at 100 degrees, disability of 30 per cent.

In the cases of wounds of the elbow joint there was no mortality. The chief cause of permanent disability was arthritis deformans. Of seventeen patients with wounds of the elbow, 11 recovered with no disability and three had a permanent disability ranging from 25 to 50 per cent.

In his summary the author states that present-day active methods of treatment are much better than

the methods previously employed. He compares the results herewith reported with statistics published in 1913.

VOGELER (Z)

Freund, E. General Chronic Suppurative Arthritis—Polyarthrits Chronica Purulenta—as a Disease Entity (Die allgemeine chronische Gelenkerkrankung—Polyarthrits chronica purulenta—als Krankheitsbild) *Arch. f. path. Anat.*, 1932, cclxxxv, 384

The author describes a new disease, polyarthrits chronica purulenta, on the basis of the postmortem findings in two cases. The condition develops at an advanced age. It affects practically all of the joints and may last for years.

Acute exacerbations occur. In the early stages the joints are filled with a thick creamy pus. The articular cartilages are more or less extensively destroyed.

The cartilage may show large excavations extending as far as the spongiosa. However, the spongiosa is very rarely involved in the purulent inflammation. In the stage of healing, only pseudankylloses form.

Chronic purulent polyarthrits may follow primary chronic polyarthrits. PHILIP LEWIN, M.D.

Ghetti, L. A Contribution to the Study of Subcutaneous Rupture of the Tendinous Insertions of the Biceps Brachialis (Contributo allo studio della sottocutanea dei tendini di inserzione del muscolo bicipite brachiale) *Chir. d'organi di movimento*, 1932, xvii, 137

Ghetti reports seven cases of rupture of the tendinous insertion of the biceps brachialis muscle. This injury is most common in men between the ages of forty-seven and forty-nine years. The author's youngest patient was forty-three years, and his oldest, sixty-one years, of age.

The rupture has been attributed to trauma and to the presence of a chronic inflammatory process involving adjacent joints and ligaments and causing a diminution in the caliber of the tendinous fibers, proliferative arthritic changes in the tendino-osseous insertion of the lacertus fibrosus, and ischæmia.

The usual symptoms are intense pain, inability to flex the forearm on the arm, and the appearance of a mass on the anterior aspect of the arm, which varies in its location according to the level of the laceration. In 68 per cent of the cases the swelling appears in the lower third of the arm. Less commonly, it is found in the belly of the biceps, and least commonly in the upper third of the arm. A mass in the upper third always signifies an intra-articular laceration of the proximal tendon of the biceps. In some cases the only indication of the condition is the swelling. These are the cases in which the rupture is preceded by chronic inflammation in joints and ligaments.

The prognosis is good. In a large number of cases of subcutaneous rupture of the long head of the biceps tendon the patient recovers sufficiently to resume his former occupation after two or three weeks. Ultimately all patients recover the ability

# SURGERY OF THE BONES, JOINTS, MUSCLES, TENDONS

## CONDITIONS OF THE BONES, JOINTS, MUSCLES, TENDONS, ETC.

Glueckert, G.: Skeletal Diseases of Growth (Altehrhe scholische delta crescens). *Calc d'organs d'orthopédie* 1933, xvii, 101.

The author discusses Knochler's disease of the second metatarsal and the scaphoid bones, calcaneal apophyitis, Perthes disease, epicondylitis humeri, Osgood-Schlatter disease, and similar affections involving the patella and trochanter. The results of his experimental and clinical research regarding these conditions have convinced him that they should be grouped together.

In all of these conditions the chief contributory factor is continuous trauma. Of 135 cases which Glueckert was able to collect, a history of definite trauma was given in 96 and a history of probable trauma in 37. As the vast majority of these lesions occur in the lower extremities which are exposed to weight-bearing and injury, the traumatic theory is apparently the most plausible. Other causes are an attenuated form of osteomyelitis, latent rickets, tuberculosis, here, embolic infection, disturbances of glands of internal secretion, lesions of the sciatic nerve, and avitaminosis.

The pathological anatomy of all of the bony lesions mentioned consists in destruction of the cartilage cells, atrophy of the ossification centers, necrosis, and replacement of bone cells by fibrous tissue proliferation.

The symptoms are local swelling, inability to support weight, decalcification, and partial or total absorption of the bone.

As treatment, the author recommends rest and immobilization of the part. S. L. GORMAN, M.D.

Revised, F.: Schüller-Christian Syndrome (Idiopathic exophthalmos of Schüller-Christian). *Klinische und ophthalmologische* 1933, xix, 667.

In a review of the literature the author was able to find only thirty-nine cases of Schüller-Christian disease. To this small number he adds a case of his own. The patient was a boy twenty-three months old. Examination disclosed a soft, doughy mass in each temporoparietal region, a large mass over the right eye, definite bilateral exophthalmos, and a purulent discharge from the antero-posterior portion of the right external auditory meatus. The right eye was more prominent than the left. X-ray examination revealed areas of decalcification in the skull, humerus, pelvis, and vertebrae. Genital and physical development were apparently arrested. All laboratory tests, including the Wassermann test, failed to show the cause of the condition.

Because of the obscurity of the diagnosis, the author subjected the child to a course of roentgen therapy. As this resulted in no apparent improvement, he tried roentgen therapy. Soon after the roentgen treatment the child increased in weight, the discharge from the right ear ceased, growth became normal, and the areas of decalcification in the bones gradually decreased in size and increased in density.

The manifestations of Schüller-Christian syndrome include:

1. Xanthomatosis of the flat bones such as the orbital, temporoparietal, and pelvic bones. Sometimes, as in the case reported, the humeri are also involved. The xanthomatous changes are characterized by a soft doughy swelling with extensive decalcification of the involved bones.

2. Exophthalmos from a mechanical intracranial or intra-orbital process. By extension, the xanthomatosis of the temporoparietal and orbital bones involves the dura mater, sella turcica, pituitary gland, and tuber cinereum. The involvement of the pituitary gland causes:

3. Diabetes insipidus with polyuria, polydipsia, and polyphagia.

In the diagnosis it is necessary to rule out metastatic hyperostosis, multiple myeloma, osseous tuberculosis, gummatous, rickets, and Paget's disease.

The cause of the Schüller-Christian syndrome is unknown, but morbid changes in the pituitary gland and the center of calcium metabolism in the diencephalon are believed to be factors.

S. L. GORMAN, M.D.

Stewart, M. J., and Taylor, A. L.: Observations on Solitary Plasmacytoma. *J. Path. & Bacteriol.* 1933, xxxv, 541.

Tumors composed of plasma cells occur chiefly in bones, where they are usually multiple and constitute a variety of multiple myeloma, and in the upper air passages, where they are usually solitary.

The authors report four cases of solitary plasma cell tumor in which the neoplasm occurred respectively in the humerus, the maxilla, the nasopharynx, and the floor of the mouth. In none of these was there any evidence of recurrence or metastasis after operative removal of the tumor.

These cases constitute evidence that there is a solitary form of plasma cell tumor occurring both in bone and the upper air passages which usually shows at most only a local malignancy and is amenable to local operative treatment.

As the solitary plasmacytoma of bone is likely to be mistaken clinically for an osteosarcoma of high malignancy biopsy should be done before radical surgical treatment is undertaken.

coma Periosteal lipomata and lipomata situated in the muscles are often very large. Reiss has called attention to their roentgenological appearance.

Lipomata in the tendon sheaths manifest themselves as widely branching extensive tumors of the type of lipoma arborescens. Of the eighteen tumors of this type described by Strauss up to 1922, only two were diagnosed definitely. In the case of one a tentative diagnosis of lipoma was made but in the cases of the others the condition was believed to be tuberculosis, tendosynovitis, or hygroma.

Articular lipomata have been described still less often. Hoffa differentiated the solitary lipoma of the knee—developed from the subsynovial fatty tissue—from the arborescent lipoma, the neoplastic nature of which he denied as well as that of the inflammatory-fibrous hyperplasia of the fatty tissue of the knee which normally lies under the ligamentum patellæ, so-called "Hoffa's disease." These lipomata are frequently discovered at operation for internal injuries of the knee. The connective tissue, fat-containing, strand mentioned by Hoffa extends with varying thickness from the plica alaris up to the intercondylar fossa. Coarser macroscopic fat-body changes in the knee are rare and as a rule are secondary. Hoffa and Becher have called attention to the traumatic origin of fat-body changes in the knee joint which are of great significance in traumatic surgery.

The author takes up in detail the symmetrical lipomata of the upper part of the ankle joint in persons with flat-feet or weak arches, neoplasms which were first described by Gaugele in 1905. Below and anterior to the external malleolus there is a more or less circumscribed and demarcated swelling of the soft parts, which frequently cannot be defined by palpation alone. As the patients often have weak ankles, this swelling may easily be mistaken for protrusion of the joint capsule with rupture of the ligamentous apparatus due to distortion. The failure of conservative treatment leads to recognition of the nature of the condition. Supportive treatment of the arch without removal of the lipoma is useless.

Like Gaugele, the author was able, in two cases, to relieve the symptoms permanently by removing the lipomata. In the case of a woman seventy-one years of age who had had improper treatment for years, Daniels found a swelling the size of a small apple below the external malleolus. This swelling was more circumscribed on the left side. On the right side it extended to the back of the foot. The patient had bilateral flat-foot. Movement of the foot joints was generally free, but in the upper part of the ankle joint it was painful. Operative removal of both lipomata was followed by primary healing. The after-treatment consisted of the use of hot air, massage, motion therapy, and foot plates. The patient, who had had slight symptoms of exophthalmic goiter, has been free from symptoms for six months.

In the case of a sixty-three-year-old woman with obesity and with arthritic deformities of the hands

and knees, tender swellings the size of the palm of the hand were found beneath both external malleoli. These swellings extended up to the leg, but were distinctly demarcated below. The patient had flat feet. Movement of the foot was free, but caused pain in the upper ankle joints. The operation and its results were the same as in the first case.

In the case of a woman with marked obesity and severe ankylosing arthritis deformans in both hips, a circumscribed tumor the size of a hen's egg was found below both the internal and the external malleoli. As treatment of the arthritis was more urgent, the tumors could not be removed.

In all of the three cases there were fibrolipomata extending into the ankle joint or arising from it which showed a distinctly circumscribed encapsulated form. The two first patients had disturbances of the thyroid, ovary, and pituitary glands. A traumatic origin of the lipomata due to weakness of the joints should be considered. This was indicated by the histological findings in the first case, in which slight traumata had caused an inflammatory infiltration. The treatment of choice is always operative removal of the lipomata to make suitable plate therapy possible.

The article includes illustrations showing the condition before and after the operation.

H. ENGEL (Z)

Lagomarsino, E. H. Flat-Foot (Pie plano). *Rev de ortop y traumatol*, 1932, 1, 417.

Following a discussion of the normal and pathological anatomy and the physiology of the foot the author gives a clinical review of 100 cases of flat-foot.

He calls attention to the fact that the arch of the foot is maintained by its peculiar bony structure and ligamentous supports. The external or calcaneocuboidal arch is lower than the inner arch, and when the weight is borne on the foot it is obliterated and comes into contact with the supporting surface. The highest point of the inner arch is the midtarsal joint between the astragalus and scaphoid bones. This joint permits motion in the tarsal region at the expense of stability.

The foot is supported by ligaments, plantar fascia, and muscles. When it is used actively, the arch is partially supported also by muscles, but when it bears the weight of the body in standing, the ligaments bear almost all of the strain. The arches are thus slightly depressed because of elasticity of the ligaments and fascia. The astragalus bearing the weight rotates inward and downward on the calcaneum and forward to the scaphoid and cuneiform bones until it is checked by the resistance of the ligaments and the interlocking of bones.

Flat-foot may be either congenital or acquired. The congenital type is due to errors of development such as supernumerary bones. The acquired type may be organic or functional. Lesions of the bones themselves, such as osteitis, rickets, and fractures of the calcaneum and astragalus, may result in flat-foot.

to flex the forearm. Several months after the accident, decided hypertrophy of the biceps brachii and coracobrachialis muscle with simultaneous atrophy of the biceps longus brachialis is observed.

Conservative treatment includes a corrective functional position of the arm, massage, and special exercises and occupational physical therapy to restore function. The operative treatment consists of suture of the ruptured tendon or transplantation of the tendon into an adjacent bone. For rupture of the peripheral end of the tendon, Ghelli recommends transplantation into (1) the acromial process, (2) the upper edge of the glenoid, (3) the tendon of the pectoralis minor or (4) the intertubercular sulcus. In cases of traumatic rupture of the *in-curtus fibrosis*, the ulna or radius may be used for an anchor.

R. L. JOHNSON, M.D.

Wagner, O., and Pendergrass, E. P.: The Intravertebral Circulation of the Vertebral Body with Roentgenological Considerations. *Am. J. Roentgenol.* 1932, XVII, 818.

In a study of seventy-five vertebrae obtained from subjects ranging from a fetus to an adult seventy-two years old the authors found that the vertebral bodies contain large venous sinuses which may occupy 40 per cent of their volume. These were studied with the aid of bleached injections made into the abdominal aorta. There are two pairs of veins for drainage. One pair emerges at the anterolateral aspect and the other at the posterior wall. They empty into the venae cavae through the lumbar veins. When these channels were followed into the interior of the vertebral body they were found to anastomose freely and to send columns up and down to the articular plates of the body. Thus is formed a cavernous sinus which is lined with flat epithelial cells. The circulation in this structure is sluggish, a fact which probably accounts for the frequent localization of primary disease and metastases in this region.

Examination of the blood elements in the venous sinuses showed narrow cells and hematopoietic tissue which suggested that this spongy bone is the site of formation and destruction of the cellular elements of the blood.

The arterial supply of each vertebral body comes from two sources: (1) branches of the lumbar arteries encircling the body from the anterior side, each of which sends one or two arteries directly into the bone, and (2) a pair of small branches from the arteries to the spinal canal which penetrate the spongy bone of the body at the posterior wall. These arteries are very much smaller than the veins which emerge from the bodies.

WILLIAM ARTHUR CLARK, M.D.

Forrest, F.: Tuberculous of the Neck of the Femur in Children (La tuberculose du col fémoral chez l'enfant). *Ann. de chir. Par.* 1932, 4, 405.

During the period when resection of joints was in vogue only massive tuberculous involvement of the femur was recognized and the more limited lesions which were amenable to conservative operation

largely escaped notice. As late as 1883, Gill regarded simple curettage as a very dangerous operation. Kocher, Vellmann, Schmidt, and Gosselin demonstrated that osteitis of the neck of the femur may heal without involvement of the joint. Finlay McFarland, and particularly Waldenström, brought some precision to the description of the various lesions.

In general, diffuse involvement of the neck of the femur represents early disease, while encysted lesions represent disease of relatively long standing which has a strong tendency to heal. Involvement of the bulbous portion of the neck may be central or peripheral. Peripheral involvement tends to extend along the upper surface of the bone. Osteitis of the trochanter usually extends to the neck, where the lesion comes into intimate contact with the synovial membrane. Of fifteen of the author's patients, only three did not have an articular reaction.

Clinically, the cases may be divided into three groups: (1) those with an attenuated arthritis, (2) those with pain in the hip but no possible articular reaction, and (3) those in which a cold abscess is the only manifestation of the disease.

At the present time cervical tuberculous is rarely operated upon. Most of the lesions are relatively diffuse and, particularly in the hip, an operation which fails to eradicate the disease completely is almost certain to result disastrously. Only the central lesions of the neck and distal end and the encysted lesions of the trochanter which have invaded the neck should be treated surgically. Even in these operations probably the only advantage of saving the bone as good results can be obtained by immobilization alone. Even after a successful operation, immobilization for from six to twelve months is essential. The operation is not considered of much value to protect the joint against invasion.

The article contains fourteen case histories and thirteen roentgenograms.

ALBERT F. DE ORDAZ, M.D.

Driels, A.: Joint Epimata of the Lower Extremity (Über GelenkEpimata der unteren Extremitäten). *Arch. f. klin. Chir.* 1932, XXX, 134.

Relatively benign subcutaneous lipomata, which do not require treatment, are frequently found in the lower extremities. Other rarer lipomata, which sometimes may be mistaken for malignant tumors, stretch the overlying skin and irritate it to the point of ulceration, while still others cause disturbances by their size. Recently the author saw a lipoma the size of an apple between the first and second metatarsal bones, which spread the toes apart so far that the patient was unable to wear a shoe.

Deeply lying lipomata that are difficult to recognize often cause symptoms by pressure on their surroundings, especially on the nerve trunks. Kautner reported a lipoma deep in the gluteal region, the character of which was not determined until operation was undertaken for a supposed sar-

the procedure is best suited to tuberculous osteoarthritis in the adult which has been rendered quiescent by immobilization. In this condition it may be substituted for astragalectomy, which is a poor operation except in the cases of children. The chief advantages of the procedure are immediate locking of the joint and extensive bony ankylosis.

The article has six illustrations, including one roentgenogram. ALBERT F. DE GROAT, M.D.

### FRACTURES AND DISLOCATIONS

Capener, N., and Pierce, K. C. Pathological Fractures in Osteomyelitis. *J. Bone & Joint Surg.*, 1932, xiv, 501.

Of a series of 1,086 cases of osteomyelitis treated in the Surgical Clinic of the University of Michigan, 1 or more pathological fractures occurred in 18. One-third of all of the pathological fractures in the clinic were due to osteomyelitis. Some of the causes of these fractures are (1) inadequate support of bones weakened by the rapid formation of a large sequestrum, (2) the removal of too much involucrum in the operation of saucerization, (3) long-standing atrophy of disuse, (4) inadequate immobilization after operation, and (5) too early weight-bearing. Of the 18 fractures cited, 16 were in the femur or humerus and 15 occurred after operation.

MAURICE L. DALE, M.D.

Mettenleiter, M. W. The Effect of Irradiation of the Thymus on Artificial Fractures in White Rats. *Am. J. Surg.*, 1932, lxxv, 177.

The fact that removal of the thymus gland in young animals causes a retardation of growth and softening of the bones indicates a relationship between the thymus and the osseous system or calcium metabolism. The hypersensitivity of the thymus to the roentgen rays is well known. Large doses of roentgen irradiation have a destructive effect on this gland. On the theory that small or fractional doses might have a stimulating effect on the thymus, and that this might result in improved healing of fractures, the author carried out a series of experiments on rats with artificial fractures. The amount of callus formation was determined by X-ray examinations at weekly intervals. It was found that the fractures became repaired more quickly in the animals subjected to roentgen irradiation of the thymus than in the controls. The author therefore suggests that small doses of roentgen-ray irradiation might prove of value in clinical cases of delayed healing of fractures.

CHESTER C. GUY, M.D.

Rotolo, G. Fractures of the Surgical Neck of the Scapula Associated with Fracture of the Clavicle (Le fratture del collo chirurgico della scapola associate a frattura della clavicola). *Arch. ital. di chir.*, 1932, xxx, 385.

The author reports four cases of fracture of the surgical neck of the scapula associated with fracture

of the homolateral clavicle. In three cases the clavicle was fractured in the middle third and in one case at the acromial extremity. In one case there were multiple fractures of the ribs.

In discussing the pathogenesis of these fractures, Rotolo says that in his opinion the fracture of the scapula is a result of direct force acting on the scapula posteriorly. Such a force would tend to push the shoulder in an anterior and medial direction. The muscles tend to maintain the shoulder upward and backward. If the ligamentous attachments of the clavicle do not yield, the clavicle is buckled forward and, if the force is sufficiently great, the clavicle is fractured. The fracture of the clavicle may be complete or incomplete.

The author has been able to produce the various fractures of the scapula in cadavers, but has been unable to cause the concomitant fracture of the clavicle because, in the cadaver, the muscular action which, in the living, immobilizes the clavicle is absent, the shoulder therefore not being kept actively in a posterior upward position. PETER A. ROSI, M.D.

Platt, H. Colles' Fracture. *Brit. M. J.*, 1932, ii, 288.

The author classifies fractures of the wrist according to the method of Destot as follows:

1. Anterior fractures, including 3 distinct types of injury: (a) fracture of the radial styloid process, (b) anterior marginal fractures, and (c) the so-called reversed Colles or Smith fracture.

2. Posterior fractures, including (a) the classical Colles fracture, and (b) posterior marginal fractures.

Of these several types, Colles' fracture is of the greatest importance because of its frequency and because of special mechanical difficulties sometimes encountered in its treatment. Of a series of 835 recent fractures of the lower end of the radius, 571 were Colles fractures, 174 were separations of the radial epiphysis, and 90 were styloid and marginal fractures.

Platt reviews the history of Colles' fracture, beginning with articles published by Petit in 1726. He cites Pouteau's report on the condition in 1783, Dupuytren's discussion of this injury in his clinical lectures, and the description of the fracture by Colles in 1814.

Most commonly, Colles' fracture results from a fall on the outstretched hand. The fracture line is transverse and usually lies within an inch of the articular surface of the radius. Frequently the ulnar styloid is fractured. In approximately 75 per cent of the cases seen by the author there is some degree of displacement. The essential deformity is a backward tilt of the distal end of the radius. This is sometimes complicated by other displacements. The relation of the fracture line to the inferior radio-ulnar articulation is important. A complete diagnosis of this type of injury is impossible without roentgenographic study.

The author advises the induction of nitrous oxide anaesthesia at the time of reduction of the fracture,

The condition may be secondary also to poliomyelitis and syringomyelia or may be compensatory to another deformity such as scoliosis, genu varum, genu valgum, rachitic curvature of the tibia and malunion of a malleolar fracture. Factors which change the equilibrium between the resistance of the tarsal arch and the weight it supports are important. The resistance of the arch may be reduced by prolonged confinement in bed, venous stasis, or chronic constitutional disorders. The load supported is increased by a gain in body weight, amputation of a foot, and sudden and prolonged action to which the foot is unaccustomed. Mechanical factors include ill-fitting footwear.

The mechanism of flat-foot consists in relaxation of the structures which maintain the longitudinal arch, especially of the inferior calcaneoscapoid ligament upon which the head of the astragalus rests. As this ligament stretches, the head of the astragalus becomes depressed and the anterior portion of the foot becomes abducted at the midtarsal joint.

The treatment employed should attempt to restore and maintain the structures of the arch in normal position. The use of commercial arch supports should be severely condemned. The method chosen to restore the arch must depend upon the causation in the particular case. The arch of the foot should be raised by means of graduated individual moulds made in plaster or some other material. When the arch is sustained by a proper support overstrained ligaments and muscles will recover. The restoration of normal physiology is aided later by passive movements, physical therapy and graduated exercises.

Operative treatment should be reserved for the very severe cases which will not respond to other forms of treatment and those in which tendon transplantation is necessary. Arthrodesis of articular surfaces with reconstruction of the bony arch by the excision of wedges has been frequently performed with satisfactory results.

WILLIAM R. MERRICK, M.D.

#### SURGERY OF THE BONES, JOINTS, MUSCLES, TENDONS, ETC.

Harrod, P., and Monteggia, M.: Amputation at the Lower Third of the Thigh. The Present Status of the Technique and the Prostheses (*L'amputazione del terzo inferiore dell'arto: Stato attuale della tecnica e dei protesi*). *Rev. d'Chir. Par.* 933, II, 361.

This article is based on research carried out at the Manefield Center for Prostheses during the past five years.

Except for the gastrocnemius, there are no important muscle attachments to the lower third of the femur. Of the large muscles which pass over this region, those on the posterior side are the longest and the most retractile. If it is desired to have a circular scar as the final result, the original line of incision must be an ellipse with the posterior

part more distal than the anterior part, as the former will retract more than the latter.

The elliptical amputation (ascribed to Duroy) is preferable to the circular amputation. It may be done rapidly with the use of a tourniquet at the time of section or with ligation of the vessels and nerves as they are exposed. The anterior part of the incision may be as low as the patella and the posterior part 2 or 3 cm. lower. The lower is transposed at the usual higher level, the perineum being treated carefully so as not to leave any tags to cause the formation of osteophytes.

The anterior flap method is of value in cases in which posterior skin is unavailable because of sepsis or some other condition, but as it does not yield a good conical stump it is not the method of choice.

To obtain the best results with an artificial limb the surgeon should form the stump to fit a pre-terminated type of prosthesis. The best point of support for weight-bearing is the ischium, the next best, the peripatellar portion of the stump and the psoas, the end of the stump. In some cases the stump may change in form so as to require a change in the point of pressure. In cases of irritative it may be necessary to change the point of weight-bearing from the ischium to the end of the stump or vice versa.

Much difficulty is experienced in bilateral femoral amputations. The first requirement is good morale of the patient in order that he may learn how to manage two artificial limbs. The authors cite four cases. In one, a very good result was obtained, the patient being able to go upstairs with a cane and to sit on the ground and get up again by himself. In two the result was fairly good, and in one it was poor.

WILLIAM ARTHUR CLARK, M.D.

Galland, M.: Key Arthrodesis of the Ankle Joint (*Le clavage de l'articulation tibio-tarsale*). *Presse med. Par.* 933, XI, 530.

Galland describes an operation for arthrodesis which employs the mechanical principle of the center key. A hole is made transversely through the ankle joint, the drill cutting equally into the articular surfaces of the astragalus and the tibia. Into the hole an antiseptic bone peg is driven. The details are as follows:

The internal malleolus is exposed by an oblique incision directed downward and forward. From the surface of the malleolus and the adjacent shaft a bone flap is fashioned with a chisel. A particle is left at the proximal end. The resulting groove is deepened to expose the interline of the joint. A thin drill is then passed through the flaps into and nearly through the external malleolus. The hole is enlarged with an 11-mm. drill.

The graft consists of a piece of tibia recovered with a twin saw or a segment of the tibia. In the latter case a dowel is made. The graft is driven through the joint and the end covered by the bone flap.

The exact indications of the operation remain to be determined. At present the author believes that

Jones, R. W. The Treatment of Fractures of the Shafts of the Tibia and Fibula A New Tibia Traction Apparatus *J Bone & Joint Surg*, 1932, *14*, 591

Jones describes a portable traction device for the treatment of fractures of both bones of the leg. In this apparatus the fragments are reduced and held by the use of a screw device and skeletal traction while an unpadded cast is applied. During the reduction the knee is flexed, but after the reduction it is extended for completion of the thigh portion of the cast. The apparatus is used also for fractures of the calcaneus and for leg lengthening. The technique of the application of ambulatory casts is essentially that of Boehler except that a rubber heel is substituted for the iron stirrup.

WALTER P. BLOUNT, M.D.

Bishop, P. A. Fractures and Epiphyseal Separation Fractures of the Ankle *Am J Roentgenol*, 1932, *xxviii*, 49

This is a discussion of the classification and mechanism of fractures of the ankle based on the work of Ashhurst and Bromer.

The classification groups together lesions which are related by the manner in which they were produced.

In discussing the anatomy of the ankle joint, Bishop emphasizes that the ligaments play an important rôle in the production of fractures of the ankle. When a malleolus is fractured it remains attached to the astragalus by these ligaments and the astragalus and malleolus become displaced together.

The most common cause of fractures at the ankle is external rotation of the foot. The line of fracture is characteristic in that it extends obliquely from above and behind downward and forward. It varies in obliquity, but usually passes through the tibiofibular joint to the external malleolus so that the anterior tibiofibular ligament is not ruptured.

In the few cases in which the lower end of the line of fracture is above the tibiofibular joint, the initial lesion is a rupture of the anterior tibiofibular ligament or a fracture of its attachment, the anterior tibial tubercle. Fracture of the fibula in these cases occurs above the joint, usually in the surgical neck but sometimes as high as the anatomical neck. Occasionally the force is not sufficient to fracture the fibula after it has torn off the anterior tibial tubercle.

A fracture of this type of the second degree is caused by continuation of the force after the fibula has been fractured. The internal lateral ligament or the internal malleolus is fractured, and in some cases there is a fracture of the posterior marginal fragment.

Fractures of this type of the third degree are rare. They occur when the avulsive force is sufficient to fracture the entire lower end of the tibia instead of the internal malleolus.

In abduction of the foot the first lesion is a rupture of the internal lateral ligament or a transverse fracture of the internal malleolus. If the force is

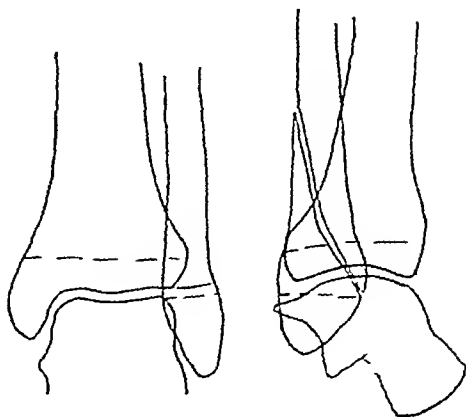


Fig. 1. External rotation fracture, first degree. Characteristic oblique fracture of the fibula above the joint.

continued, a fracture of the second degree results. If the tibiofibular ligament is not ruptured, the fibular fracture is of the crush type and involves the external malleolus only. If the ligament is torn, the fibula breaks by flexion, usually through the surgical neck (Pott's fracture).

Fractures of this type of the third degree are uncommon. In such fractures the entire lower end of the tibia is torn off instead of the internal malleolus. The fibular fracture occurs through the surgical neck.

In adduction of the foot the initial lesion is caused by the pull of the external lateral ligament which ruptures or causes a transverse fracture of the external malleolus. This is followed by a crush fracture of the internal malleolus. The third degree of this mechanism, in which the internal malleolus is represented by the whole tibia, is of the supra-malleolar type.

Fractures produced by compression are due to compression in the long axis of the leg. The simplest form is the isolated posterior marginal fracture in which the breaking off of a triangular fragment from the posterior aspect of the distal end of the tibia is the only lesion. More marked types are "T," "Y," and comminuted fractures.

Fractures caused by direct violence have no special importance from the standpoint of mechanism.

The causes of 300 fractures of the adult ankle reviewed by the author were as follows:

Cause	No.	Per cent
External rotation	163	54.4
Abduction	79	26.3
Adduction	42	14.0
Compression	12	4.0
Direct violence	4	1.3

These figures are similar to those of Ashhurst and Bromer.

In epiphyseal separation fractures the mechanisms are the same as those causing fractures in the ankle.



but states that the local anesthesia described by Bohler may be of advantage in certain types of cases.

Reduction is best accomplished by the method taught by Jones, and it is probable that the light metal splints employed by Jones are better than those of any other type. However molded plaster splints may sometimes be employed to advantage. In the author's cases the arm is usually removed from the splint at the end of the first week and given light massage and passive motion in the direction of flexion. After each massage the splint is carefully re-applied. Immobilization is continued for five weeks after the injury. In a series of cases which Platt treated without physical therapy during the five-week period of immobilization the results were equally satisfactory. The functional results in Platt's cases were classified as perfect in 75 per cent, good in 23 per cent, and poor in 2 per cent. Platt disagrees with the conclusion of Gray and Trickett that in Colles fracture with displacement the result after two years is invariably unsatisfactory.

ARTHUR H. WILLIAMS, M.D.

Ross, F.: Monteggia's Lesion (*La lésion del Monteggia*). *Chir. ital.*, 1932, VIII, 481.

The author reports four cases of a condition which he believes should be called "Monteggia's lesion" instead of "Monteggia's fracture" because it includes both a fracture of the diaphysis of the ulna and luxation of the head of the radius. Monteggia reported two cases in 1814. Ross reviews the anatomy of the region and discusses the etiology and mechanism of production of the lesion. The lesion may be caused by direct or indirect violence. Ross says that the numerous experiments performed on cadavers to explain its mechanism are of little value because in the cadaver there is no muscle contraction, which is one of the principal factors in the causation of the various types of fracture, particularly articular and peri-articular fractures.

Ross applies the term Monteggia's lesion to all fractures of the diaphysis of the ulna except fractures of the upper joint. The latter he believes, should be called luxations complicated by joint fracture, that is, anterior luxations of the forearm associated with fracture of the olecranon, a form which is very different in its clinical characteristics and pathological anatomy from a typical Monteggia lesion and requires different treatment. In the majority of cases the luxation of the radius is anterior upward and external. Posterior dislocation is exceptional.

In discussing the complications of Monteggia's lesion the author reports a case of his own, the third to be recorded in which a fracture of the middle third of the ulna was associated with a fracture of the middle of the olecranon. Special treatment resulted in complete restoration of function of the arm.

The fracture of the ulna in Monteggia's lesion is generally recognized easily, but the luxation of the radius may not be noticed on superficial examina-

tion. The surgeon should remember that fracture of the ulna without an associated fracture or dislocation of the radius is extremely rare. The prognosis depends upon the patient's age, the severity of the injury and the time that elapses between the injury and the treatment.

In cases of serious limitation of flexion, extension, and rotation of the forearm from defective reduction of the luxation or defective callus of the ulna, the permanent disability may exceed 50 per cent.

For recent cases the author advises non-operative treatment. In the four cases he reports he obtained excellent results from forced flexion of the forearm on the arm at an acute angle. In the rare cases in which non-operative treatment fails and in cases of old ununited fractures, operative treatment is indicated.

ARTHUR GOSWAMI, M.D.

Malik, S. A. B.: Dislocation of the Patella. *Bk. M J* 1935, II, 91.

In discussing the extensor mechanism of the knee joint, the author calls attention to the fact that the contracted quadriceps produces a very definite lateral pull which would result in lateral dislocation of the patella were it not for the outer condyle of the femur and the broad attachment of the patellar ligaments and its extensions.

He believes that for single traumatic dislocations of the patella reduction followed by fixation for a time with the knee in the extended position is all that is necessary. In cases of recurral and congenital dislocation operation is indicated. Malik recommends an operation which he first saw performed by Elmslie. In this procedure the capsule on the outer side of the patella is divided and the patellar tendon, together with an attached flap of bone, is partially freed from the tibia, the lower end being left attached to the peritendon to maintain the tension of the muscle. An area on the surface of the tibia, on the lower side of the tuberosity is then denuded. The outer side of the lower part of the quadriceps muscle and the tendon being now free, the patella is pulled over to the inner side and placed in its normal position and the muscle is re-aligned. This produces a gap in the capsule on the outer side with a surplus of capsule on the inner side. The surplus is detached as a flap with a proximal pedicle and drawn under the rectus femoris to the outer side of the joint. By sutures on its inner side the patella and its tendon are then fixed in position, the bone attached to the tendon being applied to the denuded area on the tibia. In this way the patella is brought to a slightly lower level than normal. Part of the displaced flap of capsule is sutured in position to fill the gap in the capsule on the outer side, and part is brought back over the rectus and sutured to itself to form a sling.

Of the six cases in which Malik has performed this operation, the result has been completely successful in five. In one, the operation was performed too recently for the outcome to be known.

PAUL C. COLONNA, M.D.

however, is the crushing of the thin cortex on the external aspect, which produces not only a flattening, but also a widening of the calcaneum

In a third degree fracture there is complete penetration of the body of the calcaneum, usually with complicated accessory lines of fracture and marked subluxation of the calcaneo-astragalus and mid-tarsal joints. The normal relations are disturbed even in the tibiotarsal joint. The foot deviates in valgus, and the plantar arch is effaced. Because of the lack of material for osteogenesis, the repair of these fractures is always slow and incomplete and permanent disability results.

The degree of deformity of the calcaneum can be accurately appreciated by determining the "tuberosity angle." This is done by drawing a line tangent to the superior retro-articular portion of the calcaneum and a line crossing the highest point on the head and the highest point on the posterior articular surface. Normally, the angle so formed is 40 degrees. In a fracture of the first degree the angle is about 20 degrees, in a fracture of the second degree, it is zero, and in a fracture of the third degree it is from -20 to -30 degrees.

The standard treatment employed in the past for these fractures consisted of immobilization and simple physical therapy. While this was sufficient for fractures of the first degree, it was totally inadequate for those which were more severe. Therefore Boyer, Legouest, Guermontprez, Cotton, and Golebiewsky attempted to break up the impaction by forcible traction and re-establish the normal height of the calcaneum. This treatment proved unsatisfactory because of the imperfect repair of the spongy bone. The posterior facet quickly sank again into the defect in the body. Some surgeons therefore were led to perform an astragalectomy and in some cases this gave a good result.

Poncelet and Morestin attempted to elevate the posterior facet by an open operation, but found that

a large defect remained in the center of the bone, the facet therefore being devoid of support. In 1911, Leriche endeavored for the first time to maintain the facet by a metallic prosthesis. The result was satisfactory. In 1928, with the same object in view, the authors began to use osteoperiosteal grafts to fill the defect in the body of the bone. It was expected that the grafts would furnish material for repair. After a sufficient delay to allow the edema of the foot to subside, the operation is carried out in the following manner.

A long incision is made posterior to the external malleolus and curved anteriorly onto the calcaneum. The lateral surfaces of the calcaneum, the external malleolus, and the astragalus are exposed, and the peroneal tendons liberated and retracted anteriorly. In this step the calcaneum is denuded subperiosteally by means of a sharp elevator. The upper surface with the articular facet is mobilized and elevated by penetrating the line of fracture with a thin spatula. This step requires great care to avoid increasing the already severe disorganization of the spongy bone. The grafts to fill the defect in the body are removed from the tibia. From one to three lamellæ are required. The operation is terminated by replacing the peroneal tendons and accurately suturing the skin.

The foot is put in plaster either immediately or after a few days depending on the circumstances. Weight-bearing is not permitted, even with the cast, until a month following the operation. As a rule the cast may be removed at the end of about two months.

Of fifteen patients who were followed for at least a year after this operation, fourteen had a good result.

The article is supplemented by diagrams and roentgenograms together with impressions of the feet showing the normal arches obtained by the operation.

ALBERT F. DE GROAT, M.D.

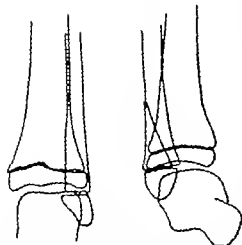


Fig. 1. Epiphyseal separation fracture due to external rotation, first degree.

of the adult, but the reaction is slightly different because of incomplete development. The greatest strain falls on the junction of the rigid diaphysis and the more elastic epiphysis.

On the basis of age, such fractures may be divided into 3 groups: (1) those occurring between birth and the ninth year; (2) those occurring between the ninth and fourteenth years; and (3) those occurring between the fifteenth year and the time of epiphyseal union.

In the early period, epiphyseal fractures are rare, the loose cartilaginous attachments of the epiphysis permitting separation without visible osseous injury.

In the period between the ninth and fourteenth years, epiphyseal separation seldom occurs without fracture.

In the period between the fifteenth year and the time of epiphyseal union, the majority of fractures do not involve the epiphyseal line, but are of the juxta-epiphyseal type or of one of the adult types.

Epiphyseal separation fractures and fractures of the adult ankle due to the same cause occur in the reverse order of frequency. Of the fractures of the adult ankle reviewed by the author 80.3 per cent were caused by outward displacements of the foot, external rotation and abduction, whereas of the epiphyseal separation fractures, only 3.3 per cent were due to such displacements. Of the fractures of the adult ankle, only 14 per cent were due to adduction, whereas of the epiphyseal separations, 54.8 per cent were due to this cause. The author ascribes the difference to the tendency of children to toe in.

Bishop reviews 31 cases of epiphyseal fracture of the ankle. As these occurred during the same period of time as the 300 fractures of the ankle in adults, the frequency of the former to the latter was 1 to 10. The causes of the epiphyseal separations were as follows.

Cause	No.	Per cent
External rotation	6	19.3
Adduction	4	12.9
Abduction	17	53.8
Compromise	4	12.9
Direct violence		3.1

NOTMAN C. BULLOCK, M.D.

Lecomment, L., and Wilmoth, P.: Subchondral Fractures of the Calcaneus; Their Treatment by Open Reduction and Osteoperiosteal Grafting. (*Les fractures sous-chondrales du calcaneus. Leur traitement par la reduction à ciel ouvert et la greffe ostéo-periostique*) *J. d. chir.* 1934, 42, 1.

Fractures of the calcaneum due to crushing constitute two-thirds of all calcaneal fractures. In the adult fracture of the posterior tuberosity by the action of the tendons of *Achilles* is less common, and in adolescents it is in reality an epiphyseal separation.

Some German surgeons do not recognize a fracture due entirely to crushing. They speak rather of a fracture due to a tearing and splitting mechanism. The theoretical diagrams are clear enough, but such a fracture has never been seen by Lecomment and Wilmoth.

In all of the authors' cases of fracture due to crushing and in all of those reported to them by other surgeons the posterior articular facet had penetrated the spongy body of the calcaneum. The gravity of the fracture depends on the depth of the penetration. On this basis, fractures of three degrees of severity are recognized.

The marked disability which results from fractures of the body of the calcaneum is understood when the anatomy is considered. The bone, entirely spongy, is provided with a cortex of varying density. The cortex is thick and resistant beneath the posterior articular facet, less resistant on the inner aspect of the bone, and extremely thin elsewhere.

In the spongy tissue three systems of trabeculae can be distinguished. The most important runs from the posterior articular facet posteriorly to the tuberosity and is a continuation of a similar system in the astragalus. The second extends from the facet anteriorly to the head. The third unites the head and the tuberosity and is confined to the lowest portion of the bone. This arrangement leaves a triangular zone of minimal resistance in the center of the body immediately beneath the posterior facet, which is easily seen in the roentgenogram as a clear area.

In a fracture of the first degree the posterior facet breaks into the spongy bone for a distance of from 1 to 3 mm. This penetration is associated with a slight elevation of the head of the astragalus and a slight change in the orientation of the surfaces of the midtarsal joint. Such a fracture does not seriously affect the statics of the foot.

In a fracture of the second degree, the crushing of the bony trabeculae and the derangement of the articulations is more severe. Of greatest importance,

ing infection" in varicose veins, its recognition, and its possible treatment.

Pathogenic bacteria may exist for a long time in the tissues without showing any clinical evidence of activity. Kendall defines "resting bacteria" as bacteria constrained from multiplying by lack of the nutritives necessary for their growth. The resting infection in the tissues is well encapsulated by fibrous tissue, but is not entirely deprived of circulation.

Of fifty-eight cultures taken from sections of ligated varicose saphenous veins, over one-half were positive and not due to contaminations. The veins were ligated in the absence of clinical infection. The bacteria grew very slowly and the cultures were frequently negative up to ten days. It seems certain that a large percentage of varicose veins harbor resting infection. This fact is of importance from the standpoint of treatment. Of about 1,500 cases of varicose veins treated in a clinic and the author's own practice, acute phlebitis followed injection treatment in 23. When this complication develops the patient returns from two to seven days after the injection complaining of great pain and often with fever. Examination reveals thrombosis of the injected vein and a large exudate around the vessel. The skin is red and hot. Frequently, if the valves are insufficient, the clot extends to the saphenofemoral junction. The author does not advise prolonged immobilization for these cases. In a few days the temperature drops and the patient is allowed to get up. The legs are strapped from the toes to a point beyond the upper limit of the clot. In 1 of the author's cases death resulted from embolism. De Takats attributes embolism to a soft infected thrombus and prolonged immobilization.

In the diagnosis of resting infection the following factors are of importance

- 1 A history of previous phlebitis
- 2 The presence of a varicose ulcer
- 3 The presence of an acute respiratory infection during the injection treatment
- 4 Clinical signs and symptoms of resting infection. Sometimes a residual pigmentation due to a hemorrhagic exudate is present. On palpation, especially after the vein has been emptied of blood, the venous walls are found thickened and painful on pressure and small phleboliths may be noted.

5 A rise in the temperature of the skin over the vein. A difference of 3 or 4 degrees is not uncommon.

There are no systemic changes in latent infections. The temperature and leucocyte count are normal. A mild activation of resting infection may be produced by provocative measures. Venous puncture, the administration of diathermy for five minutes over the suspected area, and a 30 to 40 per cent skin-erythema dose of roentgen irradiation (126 to 135 r) with heavy filters applied to the suspected area and a symmetrical area on the other leg will be followed by a rise in the skin temperature. Therefore if the patient's history or the local findings suggest a resting infection, a provocative measure, preferably roentgen-ray irradiation, should be employed. While a negative response does not exclude resting infection, a positive result is an important danger signal and contra-indicates injection treatment.

When the diagnosis of resting infection is certain, a careful search for the foci must be made. The removal of foci may aggravate the latent phlebitis, but the aggravation will be temporary. Pelvic infections are difficult to eliminate. Repeated doses of roentgen-ray irradiation for the resistant resting infection with supportive casts of gelatin-glycerin and injections of own blood or mild foreign protein offer possibilities which De Takats believes should be investigated.

EMIL C. ROBITSHEK, M.D.

# SURGERY OF THE BLOOD AND LYMPH SYSTEMS

## BLOOD VESSELS

De Takata, G.: *Vascular Anomalies of the Extremities. A Report of Five Cases. Surg. Gynec. & Obst.*, 93: 47 1927

The author discusses angioma simplex, cavernous and racemose angioma, diffuse phlebectasia, and congenital arteriovenous fistula. The following hypotheses are stated:

1. None of these vascular tumors is a true growth and all are due to faulty development.
2. The variations encountered are due to the stage of vascular development in which the aberration from the normal occurred.

A capillary aneurysm may remain a harmless birthmark until some sudden change in the general circulation starts (feeding it with blood). Cavernous dilatation then develops. Trauma may cause an angioma to expand.

Diffuse phlebectasia and congenital arteriovenous communications may have their origin in the second, rudimentary stage of development. One of the primitive vessels may persist and present an anomalous primal tree trunk which does not correspond to the histological structure of either artery or vein.

Conservative treatment is of no avail. Simple ligation of an artery or excision is not sufficient. If the anomaly is extensive radium treatment will not produce a permanent cure.

The author reports in detail five cases presenting the various types of anomalies occurring in peripheral vessels. These anomalies seem to be aggravated at puberty and if neglected may involve the muscles and deeper structures of the extremity. Many cases are best managed by multiple-stage operations performed under local anesthesia.

WILLIAM J. FICKERT, M.D.

Kretzner, W. M.: *Aneurysm of the Subclavian Artery with Fatal Hemorrhage into the Pleural Cavity. (Aneurysmabildung der Arteria subclavia mit tödlicher Verblutung in die Pleurahöhle). Deutsche Zeitsch. f. Chir.* 93: 4, 1927 328.

Aneurysm of the subclavian artery is usually due to laceration or trauma. The author reports a case in which it was associated with empyema. The patient was a woman twenty-three years old who developed polymyositis tuberculous and left sided empyema after an attack of influenza. The empyema was aspirated several times and finally drained by incision. In May an extensive rib resection was done because of residual cavity formation. In June, bleeding occurred through the drain. The drain was shortened and a blood transfusion was given, but recovery did not result. Roentgen examination again showed a pyopneumothorax on the left side

and discolored cavity formation in the apex of the right lung. On August 24, hemorrhage again occurred through the drain and was followed by death. Autopsy revealed hemorrhage from an aneurysm of the left subclavian artery into a residual cavity from the pleural empyema on the left side and cavities in the apices of both lungs.

The rarity of such aneurysms is explained by the very vascular adventitia which offers protection to ulcerative processes. Mixed bacterial infection and the mechanical relationships in the region of the vessel (the course of the large artery in the wall of the residual cavity) are also of importance. Repeated attacks of bleeding are characteristic. There have been several reports of hemorrhages from the subclavian artery into the pleural cavity. The author suggests that proximal and distal ligation of the subclavian artery and vein might have saved his patient's life. ARTHUR BOENIGSMANN (C).

De Takata, G.: "Bleeding Infection" in Varicose Veins. Its Diagnosis and Treatment. *Am. J. M. Sc.*, 103, March 37

Varicose veins are frequently infected. The importance of foci of infection in the production of inflammation of veins is evident from the fact that acute attacks of phlebitis may follow the removal of teeth or tonsils. Typhoid fever, acute respiratory infections, and influenza are often followed by thrombosis. Another group of infections in the superficial veins originates in chronic varicose ulcers. There is also a group in which no source of infection is evident. The spontaneous thrombophlebitis may be precipitated by a slight injury such as the lifting of a heavy weight. Sometimes persons who have had varicose veins for many years develop thrombophlebitis during convalescence from childbirth or operation. That this complication is not due solely to slowing of the circulation and changes in the coagulability of the blood is demonstrated by an increase in the pulse, the leucocyte count, and the temperature. Very rarely an aseptic thrombosis occurs. Of thirty-one cases of acute phlebitis in varicose veins the condition was probably due to a focus of infection in the tooth or tonsils in six and an acute respiratory infection in five. In three it followed an operation, and in one a fracture of the clavicle. In eighteen no definite source of infection could be found.

The author emphasizes that he is dealing in this article only with phlebitis of varicose veins. Infections in the normal superficial or deep veins are not included in his figures and constitute a somewhat different problem. Infection constitutes the most important contraindication to the injection treatment of varicose veins. The author discusses "root

junes Practically speaking, surgical intervention is never required. In the textbooks, particularly those dealing with dermatology, erysiploid is largely neglected.

The author presents an exhaustive review of the literature on the condition. In 1879, Koch demonstrated as the cause of erysiploid a bacillus which he called "bacillus murisepticus." Later investigators grew the bacillus in pure culture and gave it other names.

The bacillus murisepticus is of most importance in veterinary medicine. It is gram-positive, non-motile, slender, and non-spore-forming. Nevertheless it is quite resistant. The smoking or salting of meat does not always render the bacillus innocuous, even after rather prolonged cooking of the flesh of hogs affected with erysipelas the bacillus may still be found alive. In moist, alkaline earth it survives for over a year. The hog is particularly apt to harbor the organism in its throat or intestinal canal. Especially in warm summer and moist fall, various causes may initiate erysipelas. Bacillus murisepticus has been found also in rabbits, hares, deer, fish, lobsters and oysters.

As early as 1875 the clinical picture of erysiploid in man was described under the name "erythema serpens." Later, others called it "erythema migrans" or "chronic erysipelas." The name "erysiploid" was first used by Rosenbach, who demonstrated the infectious nature of the condition by self inoculation. Later investigators have shown that hog erysipelas and human erysiploid are the same disease. Hog erysipelas may appear in man in the same form as in swine, but in man the infection always occurs through the skin. There are all transitional forms from fatal sepsis to harmless erysiploid of a finger. Erysiploid is the mildest form of swine erysipelas.

The author reviews 282 cases of erysiploid which were seen in the Mana Hospital, Stockholm, in the period from 1921 to 1930. The relatively large number is explained by the fact that this hospital is in the part of Stockholm in which most of the sausage and similar factories are located and where most of the workers in these factories reside. Fifty-nine per cent of the patients were men. Thirty-four per cent worked in slaughter houses and allied industrial plants, 35 per cent worked in fishmarkets or were cooks or house servants, and 31 per cent were engaged chiefly in the preparation of food.

Erysiploid is a seasonal disease, occurring in summer or fall. The age distribution is quite variable, the disease having been observed even in children (contagion from cattle stalls). The disease is almost always localized in the fingers, hands, and forearms, but occasionally occurs in the feet and sometimes in the shoulders (carriers of animal carcasses). The portal of entry of the infection is always a healed or almost healed epidermal defect. Open wounds as the course of erysiploid are extremely rare. From the standpoint of compensation, it is important to determine whether or not a wound—epidermal defect—

is present in the region of the erysiploid. In the absence of such a lesion, there is doubt, especially in the cases of meat workers, whether the condition is an accidental or occupational disease. In Sweden, erysiploid and felon are correctly placed on the same basis. The incubation period of erysiploid ranges from one to four days.

The clinical picture is typical and should be familiar. It is usually characterized by sudden swelling and marked reddening of the involved part with a scratch in the bluish shiny, tense skin, and less frequently by blebs containing serous fluid. The involved skin is sharply demarcated from the normal skin. The patient complains of a distressing burning or itching of the skin. General symptoms such as fever are almost always absent, as is also lymphangitis. Lymphadenitis is more frequently seen. Joint complications are not uncommon and may present difficulties in the diagnosis and treatment. The diagnosis can usually be made easily on the basis of the patient's occupation. Demonstration of the organism by biopsy usually fails because the excision is often not deep enough. Deep excision for demonstration of the organism is done only when specific serum therapy is planned.

In the differential diagnosis, paronychia, exudative erythema multiforme, lymphangitis reticularis, and erythema migrans must be considered. Occasionally it is necessary to rule out bed-bug bites, frost bite, and mild forms of gout. Erysiploid confers no immunity, on the contrary it tends to recur. In the cases reviewed by the author the duration of the disease ranged from two to forty-three days. In some cases it has been as long as five months.

The treatment consists in the application of moist compresses and immobilization to prevent joint complications. The author does not favor the use of hot air, bichloride of mercury compresses, ultraviolet irradiation, homeopathy (Bier), or local injections. He disapproves also of treatment with hog erysipelas serum. Although serum treatment has many advocates, he believes that its use in clinical cases should be discouraged as it is associated with great danger of anaphylaxis and shortens the duration of the disease only slightly. He states, however, that if the disease persists longer than two weeks, serum should be tried with the consent of the patient.

GERLACH (Z)

Schumacher, O. Furunculosis of the Face and Thrombosis of the Cavernous Sinus (Gesichtsfurunkel und Thrombose des Sinus cavernosus). *Arch f klin Chir*, 1932, **CLXX**, 789.

The author reports the case of a girl twenty-one years old who had had a discharge from the left ear since her seventh year of age and two days after the healing of a furuncle the size of a hazelnut which was situated above the medial end of the left eyebrow developed headache, insomnia, and loss of appetite. The left nasolabial fold was noticeably shallow and the left palpebral fissure was somewhat narrower than the right. Examination revealed also moderate

# SURGICAL TECHNIQUE

## OPERATIVE SURGERY AND TECHNIQUE POSTOPERATIVE TREATMENT

Oettingen W F von, Calhoun, O V., Badertscher V A., and Pickett, R. E.: *Comparative Studies on Mercurochrome and Other Antiseptics*. *J Am. M. Ass.* 1933, vol. 1, 17

The authors investigated mercurochrome especially with regard to its bacteriostatic action and penetration. They draw the following conclusions:

1. It appears that, when once fixed on the surface of the tissue, mercurochrome develops no bacteriostatic action in contact with bacterial cultures.

2. It penetrates only the dead or dying mucous membranes of organs such as the bladder, vagina, and digestive tract, and may diffuse through the cornea when in contact with it for a sufficient period.

3. It does not penetrate the living skin, but is fixed in the most superficial layers of the epithelium, and it does not penetrate or stain normal muscular tissue.

4. It penetrates necrotic and dead tissue and stains them deeply and permanently.

5. The tissue toxicity of mercurochrome is relatively low, but the 5 per cent aqueous solution is distinctly injurious, as judged from excised dilated mucous membrane.

6. Mercurochrome cannot be relied upon to destroy bacteria that have penetrated the living tissue of a wound or of the skin. It can do no more than disinfect the surface and the necrotic tissue. As this limitation is shared more or less by all antiseptics, no substance can be properly called a safe and certain wound antiseptic. No antiseptic takes the place of thorough cleansing and surgical treatment. When these are not practical, for first aid or for very superficial wounds, the use of an antiseptic is probably better than no treatment at all. The antiseptic efficiency of mercurochrome is not outstanding, and for skin disinfection the aqueous solution is distinctly inferior. Its non-irritating character is of advantage especially in open wounds and when prolonged treatment is necessary but its limitations should always be borne in mind.

JACOB M. MOSE, M.D.

Ducroing, J. *Chronic Formes of Postoperative Phlebitis* (Les formes chroniques des phlébites post opératoires). *Presse méd.*, Par 1933, 11, 945

Postoperative phlebitis may last for more than six months. The author believes that when it persists longer than a month and a half it may be considered chronic. In addition to the forms readily recognized by all surgeons there are several which are less well known. In one form the only manifestation is a

slight edema which is attributed to fatigue. This is a chronic "ambulatory phlebitis" and at any time may result in embolism or phlegmasia. The author has demonstrated several cases to his students who would not believe the diagnosis until manifest signs of phlebitis developed.

The septicemic forms affect particularly the superficial veins and are more generalized than the ambulatory forms. The embolic forms keep the patient in bed for weeks with repeated emboli. They are generally not associated with marked phlebitis of the leg or pelvis, and the latency of the condition causes lack of prudence on the part of the patient who has no idea of the cause of his pneumonitis. Even the surgeon may doubt the diagnosis on account of the absence of manifest signs of phlebitis. The septicemic forms generally follow hysterectomy or prostatectomy. The septicemic condition lasts from a month to two months and a half and may be accompanied by subcutaneous abscesses, adenophlegmons, abscesses of the lung, or purulent pleurisy. Although the patient repeatedly seems to be on the point of recovery, his liver gradually enlarges and becomes painful, his spleen enlarges, and he dies. The author has seen this slow septicemic form following the use of sodium for closure of the cervix.

The chronic forms of phlebitis are always active. When they do not cause death from embolism, pneumonitis or septicopyemia they leave the patient incapacitated by edema of the limbs from which he may never recover. They frequently result from mild forms in which a diagnosis is not made and the patient is allowed to get up too early or massage is given too soon. Though massage should be given as soon as possible after recovery from phlebitis, the surgeon himself should give it first and should be sure that it is not followed by a rise in the temperature before he leaves it to the masseur.

The chronic forms of phlebitis are often kept up by manifest or latent stigmata. The author reports four such cases. In one, there was latent renal tuberculosis in another a natural stenosis, in the third, marked melancholy and probably discrete pulmonary tuberculosis and in the fourth a defective condition of the veins with spontaneous subcutaneous hemorrhages and old purpura.

AUTHOR: GENE MOSEAU, M.D.

## ANTISEPTIC SURGERY; TREATMENT OF WOUNDS AND INFECTIONS

Ellis-McCarthy, J. *Erysipeloid* (Erysipeld) *in Lethal*. 1933, 2, 3

Most cases of erysipeloid come to the surgeon for treatment because they are considered accidental in-

that other forms of medication be discontinued during the treatment as certain drugs (notably urotropin, quinine, methylene blue, formalin compounds, and other antiseptics) are destructive to the bacteriophage

HAROLD C. MACK, M.D.

### ANÆSTHESIA

Sebening, W. Recent Researches and Clinical Advances in Avertin Narcosis. *Anes. & Anal.*, 1932, XI, 145

From four years' experimental and clinical experience the author concludes that avertin anæsthesia merits the consideration of every anæsthetist and fulfills the important requirement of "safety first." In Schmieden's Clinic about 50 per cent of all operations are carried out under this type of anæsthesia. The total number of cases in which avertin anæsthesia has been used is about 5,000. The greatest care must be used in giving the enema. The time required is ten minutes. A 2.5 per cent solution of avertin is employed. The author condemns

the intravenous administration of the drug and the combination of avertin with scopolamin.

Contra-indications to avertin anæsthesia are ileus colitis, tumors of the colon, icterus, acute kidney diseases, and pulmonary diseases. The incidence of complications during the anæsthesia has decreased as improvement of the technique and careful attention to details have reduced the frequency of respiratory and circulatory disturbances.

GEORGE R. McAULIFF, M.D.

Lindemulder, F. G. Spinal Anæsthesia. Its Effect on the Central Nervous System. *J. Am. M. Ass.*, 1932, XCIX, 210

The author believes that complications following spinal anæsthesia are due to a toxic effect exerted by the anæsthetic on the spinal cord and the spinal nerve roots which is manifested both clinically and pathologically. He states that the pain of which the patient usually complains can be explained by a pathological study of the nerve roots.

GEORGE R. McAULIFF, M.D.



rigidity of the neck and weakness of the left abdominal muscles.

Three days after presenting himself for examination the patient was subjected to radical operation on the left ear by an otologist. The next day the stiffness in the neck had somewhat decreased. However on the following day a swelling appeared in the region of the right eye and the right eyeball protruded. The swelling and protrusion increased and death occurred on the eighth day after the beginning of the illness. The day before the patient died an oculist opened the orbital cavity on the right side, but no pus was found.

Autopsy disclosed a purulent staphylococcal meningitis at the base of the brain. The left cavernous sinus was partially and the right cavernous sinus was completely filled with pus. The right basilar plexus and the right inferior petrosal sinus also contained pus, and the capsule of the tympanic membrane was infiltrated with purulent material. Purulent foci the size of a hazelnut were found in the lungs.

From the autopsy findings the author concludes that at first there was only a partial thrombosis and suppurative breaking down in the left cavernous sinus, that this process extended to the right cavernous sinus by way of the anterior and posterior intercavernous sinuses and that from there, by the retrograde route, thrombosis of the veins of the right orbital cavity occurred with protrusion of the right eyeball and finally involvement of the pia mater and meningitis. He believes it would have been better to express the cavernous sinuses as soon as the swelling appeared about the right eye. *Max Simon (S)*

**Schubach, A.** The Present Status of the Bacteriophage Question (L'Etat actuel de la question du bactériophage). *Rev. hyg. et m. pub.*, 23, 396.

The bacteriophage is found chiefly in persons recovering from dysentery conditions, but certain types are recovered also from apparently healthy persons who have apparently never been subjected to infection. It is present also in pathological crusts, earth, and water. It is invisible even to the ultra microscope and is filterable. It is effective in infinitesimal doses. It grows only in the presence of virulent bacteria—never in sterile cultures. Its lytic power is subject to great variations. It is not only cytolytic, but also cytostatic. It is easily absorbed by organisms upon which it has no effect. It may be conserved for long periods of time. It is resistant to temperatures below 75 degrees C., to bile, to a 25 per cent solution of sodium fluoride, and to a 24 per cent solution of phenol. D'Harelle believes it may be centrifuged, but this is denied by Bordet and Clocq. It passes through very fine colloidal filters. It is specific, acting only upon the bacteria causing the infection. It has antigenic properties. When it is inoculated into animals it produces a specific anti-bacteriophage.

Investigators differ markedly in their interpretation of these characteristics. D'Harelle regards the

bacteriophage as a living entity a filterable virus. Bordet, Clocq, and Grailh deny this, believing that a living organism is incapable of resisting temperatures and chemicals to the extent shown by the bacteriophages. They are of the opinion that the bacteriophage represents a lytic product of the bacterial cell itself. Katschinsky considers it a catalytic agent produced by the glands of digestion and possibly the leucocytes (a diastase). Bell believes it to be a dissociation product of bacteria, the many small particles forming a colloidal suspension capable of lysing the bacterial protoplasm. Leboeuf and Carro speak of the liberation of normal lysins which are specific for the organisms which produced them. Reesenthal suggests the possibility that the bacteriophage is an ultravirus which transforms vegetative forms into autospores and lives at their expense. Grailh believes that the phenomena of Tsvet and d'Harelle are identical. This view is not accepted by D'Harelle. While all investigators admit the existence of, and the effects produced by, this principle, there is no unanimity of opinion concerning the mechanism and nature of the principle.

The fact that the lytic principle is present only during the period of convalescence suggests the possibility that its administration may aid in cutting protracted infections in which the bacteriophage does not develop spontaneously. Its administration has proved beneficial in the treatment of bacillary dysentery and viral tuberculosis. In colon bacillus infections its use has yielded indifferent results because isolation of the specific bacteriophage is rendered difficult by the multiplicity of the strains of colon bacilli. As a rule acute infections respond more readily than chronic infections. A specific bacteriophage has been isolated in typhoid fever, plague, cholera, and staphylococcus infections respond uniformly well to bacteriophage therapy. The ideal form of treatment utilizes the bacteriophage derived from cellular filtrates, intestinal mucosa, pus, bacterial cultures, and other products of the patient under treatment. When antibacteriophage cultures are not obtainable, specific cultures may be prepared by adapting laboratory cultures to the organism responsible for the disease. This requires careful isolation of the causative organism. Stock cultures (without adaptation) are available. The bacteriophages may be administered locally hypodermically by rectum, by bladder and by mouth. Several methods of administration may be employed simultaneously. The usual dose for hypodermic injection is 3 or 4 c.c. By mouth, bladder or rectum, from 10 to 15 c.c. are given. Subcutaneous injections may result in mild general or local reactions, but these are transitory and harmless. Other modes of administration cause no reaction. In cases in which the treatment is successful almost immediate benefit is noted. When improvement is not apparent immediately prolonged and repeated administration of the bacteriophage will be useless. As a rule the injections are repeated three or four times and if favorable results are manifested they are given often. It is essential

previously could not be demonstrated roentgenographically. In none of the eighteen patients on whom the method was tried during the last nine months was there an unfavorable reaction or undesirable result.

ADOLPH HARTUNG, M D

Coutard, H, and Baclesse, F. Roentgen Diagnosis During the Course of Roentgen Therapy of Tumors of the Larynx and Hypopharynx. *Am J Roentgenol*, 1932, xxviii, 293

The systematic use of roentgenography of the cervical region is of the greatest importance in the diagnosis of epitheliomata of the larynx and hypopharynx and the study of the effect of roentgen therapy on these tumors.

The authors give a description of the roentgenographic appearance of the normal larynx and hypopharynx which is illustrated with roentgenograms and sketches. They discuss in detail the semirigid osteocartilaginous framework, the soft-tissue shadows, the radiotransparent portions, and the relationships of the various segments of the larynx and hypopharynx.

Roentgenographic study of the cervical region is of aid not only in the early diagnosis of epitheliomatous lesions of the larynx and hypopharynx, but also in the determination of the suitability of the tumor for roentgen therapy. It reveals the probable point of origin and the extent of the lesion and shows whether it has invaded the cartilage and whether it is fungating or infiltrating. Such information makes it possible to decide whether the condition should be treated by roentgen irradiation alone or combined with surgery. During and after roentgen therapy, roentgen studies may help to determine the best methods of applying such treatment and whether it should be continued or terminated.

The changes in the roentgen appearance of the larynx and hypopharynx when an epithelioma develops are due to

1 The projection of very dense shadow onto a normally clear transparent space without distortion of the normal segments and spaces. This indicates the presence of a fungating tumor.

2 Distortion of the normal segments and spaces. This occurs in complicated cases of infiltrating tumor and simple cases of epithelioma which has attained a considerable size.

The authors report a number of illustrative cases.

ADOLPH HARTUNG, M D

Liberson, F. Deep X-Ray Therapy in the Treatment of Painful Heel. *J Urol*, 1932, xlviii, 105

In a case of spurs of both calcanei in which operation failed to give relief, deep roentgen therapy was used as a last resort. The results were so favorable that they led to the use of the roentgen treatment in other cases and eventually to abandonment of the routine operative procedure previously employed.

To date, thirty-one cases of periostitis of the os calcis have been treated by deep roentgen therapy. The author tabulates these with regard to the age of the patient, the symptoms, the etiology, the roentgen diagnosis, previous treatment, the type and number of roentgen treatments, the time elapsing between the patient's admission to the hospital and the roentgen treatment, the duration of the roentgen treatment, the number of days the patient remained in the hospital, and the results. The irradiation technique employed and the roentgen findings which served as indications for it are described.

In conclusion Liberson states that when local deep roentgen therapy was given simultaneously with the use of general measures to eradicate any gonorrheal infection present the average stay in the hospital was decreased and a more permanent result was obtained in a greater number of cases.

ADOLPH HARTUNG, M D

# PHYSICOCHEMICAL METHODS IN SURGERY

## ROENTGENOLOGY

Dickson, W. H.: Thorotrast. A New Contrast Medium for Radiological Diagnosis. *Canadian J. Res.* 33, 227, 1935.

Being attracted by the possibility of solving diagnostic problems by the administration of thorium in colloid solution introduced by Rast for the study of the liver and spleen by the roentgenological method, the author, in conjunction with Macdonald and Irwin, used this procedure extensively in experimental and clinical studies to obtain information relative to the method of absorption, deposit, elimination, toxic reaction, radio-activity and pathological changes in the viscera showing the greatest retention of the thorium and any changes in the blood picture which might point to an untoward result. Thorotrast a colloidal solution of 35 per cent thorium dioxide of high dispersion and low toxicity when injected intravenously possesses the property of depositing itself throughout the cells of the reticulo-endothelial system. The liver spleen, bone marrow and lymphatic glands all receive relatively the same amounts per gram of volume. Smaller amounts are found in the adrenals and ovary and slight deposits elsewhere. The dosage varies with the viscera to be studied and whether merely an outline of the liver or spleen or complete impregnation of these organs is desired. In rabbits it is possible to give 5 c.c.m. per kilogram of body weight without causing ill effects. In humans beings a solid white shadow of the liver and spleen may be obtained with 0.5 c.c.m. per kilogram of body weight.

None of the animals used in the authors' experiments showed any untoward effects or any microscopic evidences of structural change or damage of a pathological nature. During the first few weeks after the injection no appreciable decrease of deposits was noted. Three months after the injection, the density of the liver shadow indicated that the liver still contained approximately 90 per cent of its original content of thorium. Sufficient time has not yet elapsed to determine the time required for complete elimination. The spleen, bone marrow, lymph glands, and ovary gave no evidence of elimination during the period of investigation. Radio-activity of the impregnated organs has been proved absent.

Prior to the demonstration of the absence of harmful reactions in animals, injections of thorotrast were given only to patients past medical or surgical aid. At first they were given only in cases of carcinoma with proved metastases in the liver. Later they were given to patients with extensive gastric or intestinal carcinomas to demonstrate the presence or absence of metastases, and still later to those with typical cirrhosis of the liver. The technique was as follows:

A daily dose of 35 c.c.m. of thorotrast was administered intravenously for three days. On the fourth day roentgenograms were made of the abdomen on the Potter-Bucky diaphragm and thereafter roentgenograms were made daily for several days with the same time, distance, kV. and mAs, and milliamperage until the greatest deposit of the dioxide was noted in the liver and spleen.

A well-outlined liver smooth and homogeneous in density is considered to rule out definitely the presence of carcinomatous change. Metastases appear as areas lacking thorium deposit and having a punched-out appearance. The spleen is usually demonstrated by a smooth shadow of equal density throughout. Complete absence of the splenic shadow may be due to thrombosis of the splenic artery or leukemia. Enlargement of the spleen is very easily demonstrated. In several of the cases studied, cirrhosis accompanied by splenic enlargement was well demonstrated. Cysts and tumors of the spleen all show as negative shadows in the surrounding solid splenic tissue. Any damage to the reticulo-endothelial cells will cause absence of thorium dioxide deposit.

Besides the metastases present so often in the liver other pathological lesions are well demonstrated. Cysts and abscesses are evidenced by complete absence of the salt in the diseased region and a smooth, homogeneous shadow in the uninvolved areas. In cirrhosis of the liver the shadow is greatly decreased in density and the liver is shrunken. The method described will be found of great advantage also in the differential diagnosis of abdominal tumors in the left and right hypochondrium and in the study of enlargement and shrinkage of the liver and spleen under different circulatory conditions.

In addition to its uses in conditions affecting the liver and spleen, thorotrast has been employed in studies of the vessels of the brain by introducing it into the common carotid artery. It may be used also to study the arterial system of the limbs and the abdominal aorta. The localization of thrombosis and embolism, and the development of collateral circulation may be demonstrated by it. Because of lack of irritating properties and its strong radio-opacity thorotrast possesses certain advantages over other solutions commonly used as contrast agents, such as the iodides in urography. By means of it bronchus trunks in copyprene may be well outlined, bronchial fistulae may be demonstrated, and bronchiectatic cavities may be shown. It has proved of value also in obstetrics by permitting visualization of the placenta and showing its size and position.

In conclusion the author states that thorotrast is an absolutely harmless contrast medium which offers invaluable aid in the diagnosis of lesions which

Carerj, L. Melanomata of the Skin and Their Genesis as Related to Pigmented Cells of the Skin and to Pigmented Nævi (I melanomi cutanei e la loro genesi in rapporto agli elementi pigmentari della cute ed ai nei pigmentari) *Clin chir*, 1932, viii, 558

The author reports a subvoid melanoma and cites two others that were sent to him for histological examination. The article is copiously illustrated with photomicrographs and a colored plate showing the forms of some of the cells. From a study of these neoplasms the author concludes that the pigment-producing cell is an epithelial cell (melanoblast) whereas the chromatophore is a histocyte with a capacity for phagocytosis. The cell of a nevus is a melanoblast which is not much differentiated, while the cell of melanotic tumors is a melanoblast which is extremely undifferentiated. It is always an epithelial cell in various phases of functional and morphological development. The melanotic tumor is an epithelioma. It may be called a "melanoma" if that term is used to mean a malignant epithelial tumor capable of the autochthonous formation of pigment.

AUDREY G. MORGAN, M.D.

#### GENERAL BACTERIAL, PROTOZOAN, AND PARASITIC INFECTIONS

Raiford, T. S. Systemic Blastomycosis. *Bull Johns Hopkins Hosp*, Balt., 1932, li, 61

Raiford reports a case of systemic blastomycosis with primary involvement of the skeletal system

and none of the usual concomitant lesions. He refers to the literature and states that the pathological lesions are similar to those of tuberculosis and chronic osteomyelitis with marked osteolysis and minimal new-bone formation.

The clinical features resemble those of a general infection. The prognosis is uniformly poor even though sometimes there is a response to drug treatment. The use of copper sulphate has been suggested, but the author believes that potassium iodide, ethyl iodide, and gentian violet are more efficacious.

LOUIS P. GAMBEA, M.D.

#### DUCTLESS GLANDS

Reilly, W. A., and Lissner, H. Laurence-Moon-Riedl Syndrome. *Endocrinology*, 1932, xvi, 337

In a review of the literature the authors were able to find the reports of seventy-three cases in which the diagnosis of Laurence-Moon-Riedl syndrome appeared to be justified. To these cases they add four more.

The cause of the condition is obscure. The classical characteristics are obesity, genital dystrophy, retinitis pigmentosa, mental deficiency, and familial occurrence.

The use of opotherapy, chiefly with thyroid and pituitary substance, has been tried by many clinicians with indifferent success. However, in two of the authors' cases, opotherapy was followed by weight loss, increased animation, and improvement of vision.

JACOB M. MORA, M.D.

## MISCELLANEOUS

### CLINICAL ENTITIES—GENERAL PHYSIOLOGICAL CONDITIONS

Rueckert, W.: The Treatment of Fat Embolism (Beitrag zur Behandlung der Fettembolie) *Munchener med. Wochenschr.* 1933, I, 709.

The author calls attention to the three essentials for the development of fat embolism: (1) the destruction of fatty tissue, (2) the opening or gapping of veins (especially traumatized veins of bone) and (3) a mechanical factor favoring the entrance of fat into the veins.

Fat embolism has two characteristic clinical pictures, a pulmonary and a cerebral picture. Its onset is by no means always sudden. The length of time elapsing before its occurrence varies. As a rule the first symptoms are noted from four to ten hours after the accident. At the Marburg clinic, considerable amounts of fat have been demonstrated in the large veins leading away from the site of fracture as late as four days after the accident. When the injured person recovers, the major part of the fat is discharged through the kidneys and the rest is destroyed by phagocytosis or mechanically consolidated and then expectorated by Spence.

In the discussion of the prophylaxis and treatment of fat embolism the author cites a variety of recommendations and attempted procedures which he believes show a certain lack of plan. He himself favors the entirely new method of Klapp, which was described at the surgical Congress of the Middle Rhine District in 1931. In cases of severe trauma in which there is danger of fat embolism, Klapp always exposes the site of fracture by a large incision and evacuates the hematoma and broken-down fat. He then carefully closes the incision and immobilizes the fracture on a wire-extension apparatus. When the symptoms of fat embolism are already present he ligates the principal efferent veins in addition.

SCOTT (X)

Krause, R. R.: A Review of Granulocytopenia (Agranulocytosis) *J. Lab. & Clin. Med.* 1933, XVI, 99.

Granulocytopenic conditions may be classified etiologically as follows:

1. Agranulocytopenia, in which disappearance of the neutrophils is due to chemical poisoning.
2. Agranulocytopenia, in which depression of the bone marrow is due to excessive X-ray therapy.
3. Agranulocytopenia, in which the neutropenia is due to the toxic effect on the bone marrow of a bacterial toxin such as that of the bacillus pyocyaneus.
4. Agranulocytopenia, in which there is a depression of the bone marrow due to an unknown agent.

5. Aleukemic lymphatic leukemia.

6. The leukopenia associated with an acute infectious disease such as typhoid.

7. Rossoli infantum, a neutropenia occurring in infants.

Agranulocytosis is due primarily to a dysfunction of the bone marrow. It occurs most frequently in middle aged women. The acute fulminant type with or without infection is characterized by extreme weakness and prostration. It may terminate fatally or become chronic without acute attacks.

The myeloblastic, thrombocytopenic, or erythroblastic phases may be affected singly or in any combination.

For cases complicated by a decrease in the platelets and hemorrhages without ascends the term "thrombopenic granulocytopenia" is proposed to differentiate the condition from idiopathic purpura in which aplasticity is of distinct benefit.

The treatment of granulocytopenia is very unsatisfactory. Of most value are blood transfusions and frequently repeated small doses of X-ray irradiation. The prognosis is poor.

HAROLD M. BARK, M.D.

Oswick, N.: A Contribution to the Study of Sympathetic Gangrene (Contribution à l'étude de la gangrène sympathique) *Rev. de chir. Par.* 1933, II, 44.

This report is based on 115 cases of gangrene of the lower extremities. In every case a histological examination of the vessels was made. The author recognizes 3 forms of gangrene—the juvenile, the prurient, and the senile.

The only etiological factors that can be recognized are exposure to cold, malnutrition, overwork, alcoholism, and infectious disease, notably syphilis.

Histological sections show a constant change—parietalitis and arteriosclerosis. The vessel may be filled by an organized or unorganized thrombus. The extent of the obliteration depends upon the intensity of the inflammatory process. Because of extension of the inflammation from the vessels, the surrounding tissues become sclerotic and infiltrated by lymphocytes. The infiltration is usually diffuse, but may be focal. In some of the cases reviewed was the giant-cell reaction of Boerger observed.

The inflammation appears to begin in the adventitia and perivascular tissues and to involve the other tissues of the vessels secondarily. In aged persons there is calcification of the aorta.

Oswick concludes that gangrene is never caused by arteriosclerosis alone, and that so-called arteriosclerotic or senile gangrene is produced by the same inflammatory process that causes gangrene in young persons.

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